ELECTRIC LIGHT AND POWER
Annual Index

Index to Volume 38, January-December, 1960

PERSONNEL

PLANT DESIGN

POLES

PUBLIC RELATIONS

RATES

REGULATION, VOLTAGE

REGULATORY MATTERS

RELAYING

RESEARCH

RIGHT-OF-WAY

RURAL SERVICE

SAFETY

STREET LIGHTING

SUBSTATIONS

SYSTEM PLANNING

SYSTEM STUDIES

AUTHORS

CALENDAR OF EVENTS

December 13-15—Institute of Radio Engineers, 1960 Eastern Joint Computer Conference, Hotel New Yorker and Manhattan Center, New York, N. Y.

December 13—Electric Companies Public Information Program, Steering Committee Meeting, Edgewater Beach Hotel, Chicago, Ill.

December 13-14—National Safety Council, Public Utilities Section, Executive Committee Meeting, Statler Hilton Hotel, New York, N. Y.

December 15—Missouri Basin Inter-Agency Committee Meeting, Martin Hotel, Sioux City, Ia.

December 15-16 — Edison Electric Institute, Residential Electric Heating and Air Conditioning Committee Meeting, Cincinnati, Ohio.

January 17-19, 1961—Instrument Society of America, Winter Instrument-Automation Conference and Exhibit, Sheraton-Jefferson Hotel and Kiel Auditorium, St. Louis, Mo.

January 19-20, 1961—Edison Electric Institute, Transmission and Distribution Committee, Warwick Hotel, Philadelphia, Pa.

January 23-27, 1961 — Doble Engineering Conference, Boston, Mass.

January 25-26, 1961—Southeastern Electric Exchange, Legal and Claims Committee Meeting, Miami Beach, Fla.

January 26-27, 1961—Pennsylvania Electric Association, Engineering Section, Communications Committee Meeting.

January 29-February 3, 1961—American Institute of Electrical Engineers, Winter General Meeting, Statler Hotel, New York, N. Y.

February 2-3, 1961 — Pennsylvania Electric Association, Prime Movers Committee.

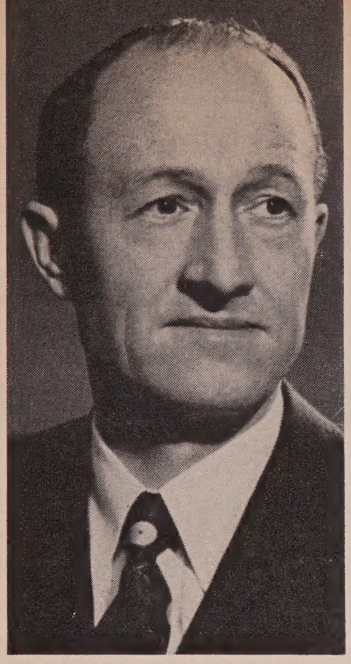
February 5-7, 1961—National Association of Purchasing Agents, Public Utility Buyers Group, Statler Hilton Hotel, Detroit, Mich.

February 13-16, 1961—American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Annual Meeting and 15th International Heating and Air-Conditioning Exposition, International Amphitheatre, Chicago, Ill.

February 16-17, 1961—Pennsylvania Electric Association, Engineering Section, Electrical Equipment Committee, Pick-Roosevelt Hotel, Pittsburgh, Pa.

March 5-8—Third Annual Lighting Exposition, World Lighting Forum, New York Coliseum, New York, N. Y.

INDEX TO ADVERTISERS AND THEIR AGENCIES



LIGHT AND POWER LINES

Our Industry Girds Itself For The "Soaring Sixties."—Not only is our electric light and power industry keenly aware of the many challenges that face it in the decade ahead but it is exhibiting firm determination to meet those challenges head on. In so doing, our industry will contribute in large measure to creating what many believe will prove to be the "Soaring Sixties."

Many of the more important areas in which our industry is forging ahead with new zeal and confidence are touched upon by leading industry spokesmen in the special "Look Ahead" section of this issue. Their views are deserving of close attention by all segments of our industry, for they help to chart our industry's course in the year ahead.

Of prime importance to everyone in our industry is the magnitude and makeup of the utilities' new-construction program for the year ahead. Through the cooperation of electric utilities throughout the nation, we are enabled to closely estimate our industry's over-all program and also its detailed equipment requirements. These findings will be published in our Jan. 15 issue, together with EEI's own year-end report, and a comprehensive analysis of long-range trends in power use, all profusely illustrated with special EL&P charts.

It appears now that our electric utilities are budgeting for new construction in 1960 that will exceed 1959 new-construction expenditures by close to three percent. The anticipated total expenditures approximate $4.3-billion, with about 40 percent to be invested in new generation facilities, 17 percent in new transmission facilities, 38 percent in new distribution facilities and five percent in general plant.

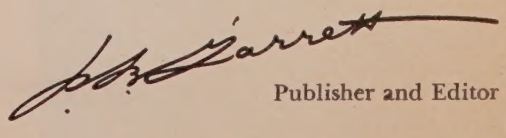
Granted that 1960 will fall short of establishing all-time highs in construction of new facilities by the electric utilities, their program is still one of the largest in the nation and carries with it a commensurate challenge to all parts of our industry.

A Step In The Right Direction—Is it not extremely important to any power company that its employees be alerted at all times to new laws passed by Congress, as well as pending legislation, that might adversely affect the company's operations and their jobs? It is apparent that the Wisconsin Public Service Corporation thinks so, for its employee magazine recently carried such a "legislative scoreboard."

Brief resumes were given on four such bills passed by the 86th Congress. Included were HR 9105, the Public Works Appropriations bill for 1960, also referred to as the "Pork Barrel" bill; HR 7523, providing a one-year extension of the 52 percent Corporate income tax rate; HR 3460 authorizing TVA to issue 50-year revenue bonds to finance its future power program; and HR 7175 appropriating $136-million for rural electrification, $79-million for rural telephones, and a $25-million contingency fund for each program.

Also briefly reviewed were four pending bills that would authorize expenditures totaling well over one-half billion dollars for new government-financed power projects, plus a bill to amend the Internal Revenue Code for 1954 so as to provide that expenditures by public utilities for "propaganda" advertizing, lobbying, and other political purposes shall not be allowed as deductions from gross income.

This company's effort to inform its employees in this important area is to be highly commended, for there is no substitute for an informed public, of which power-company employees are a key element.



Publisher and Editor

a Haywood Publication

HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP and ELECTRIC LIGHT

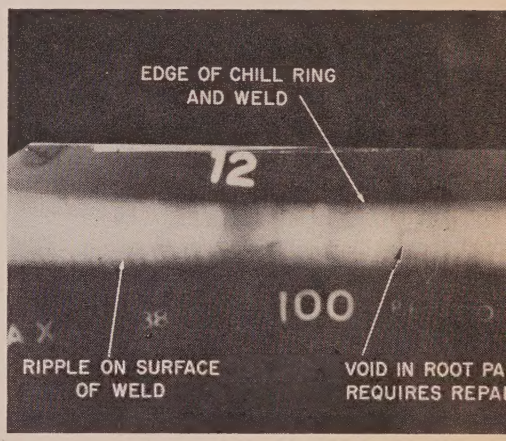
Vol. 38 Contents for January 1, 1960 No. 1

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge of 50 cents per single copy and $10 per year for domestic mailing, and $1 per single copy and $15 per year for all mailings outside the United States and her possessions. Accepted as Controlled Circulation publication at Lafayette, Indiana.

nd POWER

OUR COVER

The big challenges for electric utilitymen at the start of the new decade—including a few depicted by EL&P Artist Schiavo—are outlined by 15 industry leaders on pages 33-44.



Checking welds in pipe type cable by x-ray and gamma ray expedites job completion, trench backfilling and pavement restoration.

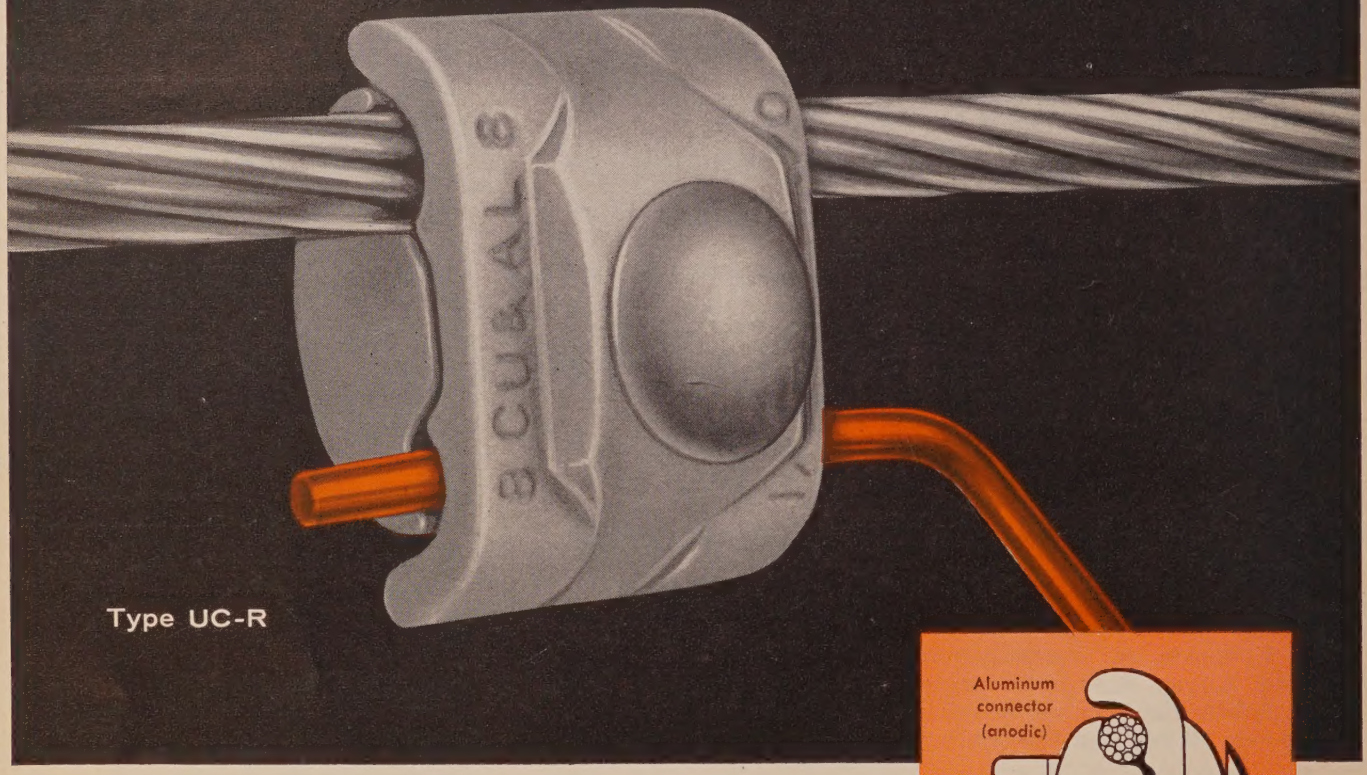
MANUFACTURERS / PRODUCTS

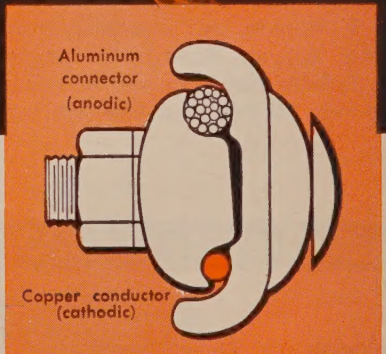
Helicopters solve near-impossible transportation problem in construction of Arizona Public Service Company Grand Canyon Line.

TAPIT

connects Aluminum to Copper...

*better... for 35% less**





MASSIVE ALUMINUM TAPIT MINIMIZES CORROSION. The larger the mass of aluminum (anodic) compared to copper (cathodic), the less the galvanic corrosion in an aluminum-to-copper connection. Note massiveness of aluminum TAPIT connector in relation to copper conductor.

Field experience and extensive tests have proven that the massive aluminum TAPIT design withstands effects of galvanic corrosion better than copper-bushed or plated aluminum connectors on aluminum to copper conductor combinations.

*Massive aluminum design also... by eliminating need for copper bushings or special plating... saves at least 35% in cost of connectors for aluminum to copper.

Only five sizes required for joining any conductor combination in #8 thru 400 Mcm range. Stocking is simplified... TAPIT can also be used on aluminum to aluminum. Also available with PENETROX sealed in with STRIPSEAL.

Ask your Burndy representative how you can save 35% on aluminum to copper connections—and get better connections —or write directly to Burndy, Norwalk, Connect., or Toronto, Canada.

TAPIT®— *another engineered solution to your connector problems by*

BURNDY

58-12

Norwalk, Connect. In Europe: Antwerp, Belgium Toronto, Canada

LIGHT AND POWER LINES

GOOD TIMES AHEAD . . . For The Nation And For Our Industry — Bullish predictions for 1960 are practically unanimous. So much so, in fact, that as a nation we shall need to beware the pitfalls of overconfidence.

All of the ingredients are at hand for a bigger and better 1960; possibly the best year yet. We have higher per capita income and purchasing power, together with healthy consumer buying spirit. Capital goods expenditures are on the increase. Inventory building is due to exert a powerful economic force. There is even the likely prospect of reaching our long-anticipated half-a-trillion-dollar economy.

On the debit side we of course have the threat later on, of a possible walk-out on the railroads. But the mighty force of public opinion and legislative action may blow away even these clouds on our rosy horizon.

Our industry could just rest on its oars and hope to be carried along on this tide of good times. It won't be that simple, for the challenges and the problems of our industry are ever with us . . . many of them essentially the same as they were a year ago, and all displaying strong evidence of their continuing nature.

We have our ever-present problem of selective loadbuilding designed to materially improve system load factor and increase net return on investment. With the entire industry expending many millions of dollars and hard, concerted effort on the electrical living program, there are brighter prospects in this area than ever before.

Electric heating—the key factor in offsetting the summer air conditioning peak—is clearly off to a running start at this point and offering the industry's principal bulwark against the inroads of stepped-up gas competition.

Our industry's healthy margin of reserve largely eliminates any present problem in meeting even greatly increased demands on our generating capability. However, deferred strengthening and expansion of transmission and distribution facilities may result in serious bottlenecks if load growth should exceed load predictions.

Unless all our long-range prognostications fall far short of expectations, our entire industry still faces the great problem of creating a doubled national network of power systems in a limited number of years, with little or no increase in utility manpower.

The extremely severe fluctuation in levels of purchasing that have afflicted our industry in recent years have had serious repercussions among the electrical manufacturers. Highly-trained production forces have had to be reduced in size. Some research and development work has had to be curtailed. All of which can lead to large headaches for the electric utilities later on.

Looming large in tomorrow's picture is the impact of ballooning scientific research on a national scale. Some of the fruits of these vast efforts are just beginning to emerge from our laboratories and can be expected to result in entirely new products and probably whole new industries. And most of them undoubtedly will be big consumers of electricity.

Our short-range and long-range prospects are exhilarating and challenging. But those good times ahead won't "just happen"; of that we can be sure. It will take the traditional American drive for an ever-better life. And our industry must keep in the forefront of this drive if it is all to come to pass.

Publisher and Editor

HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

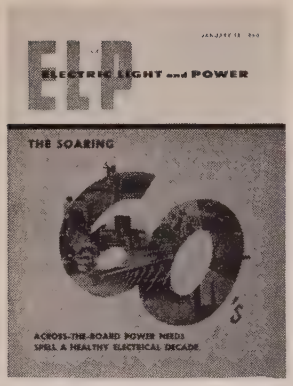
- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

EL and P

ELECTRIC LIGHT

Vol. 38 Contents for January 15, 1960 No. 2

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge of 50 cents per single copy and $10 per year for domestic mailing, and $1 per single copy and $15 per year for all mailings outside the United States and her possessions. Accepted as Controlled Circulation publication at Lafayette, Indiana.



OUR COVER

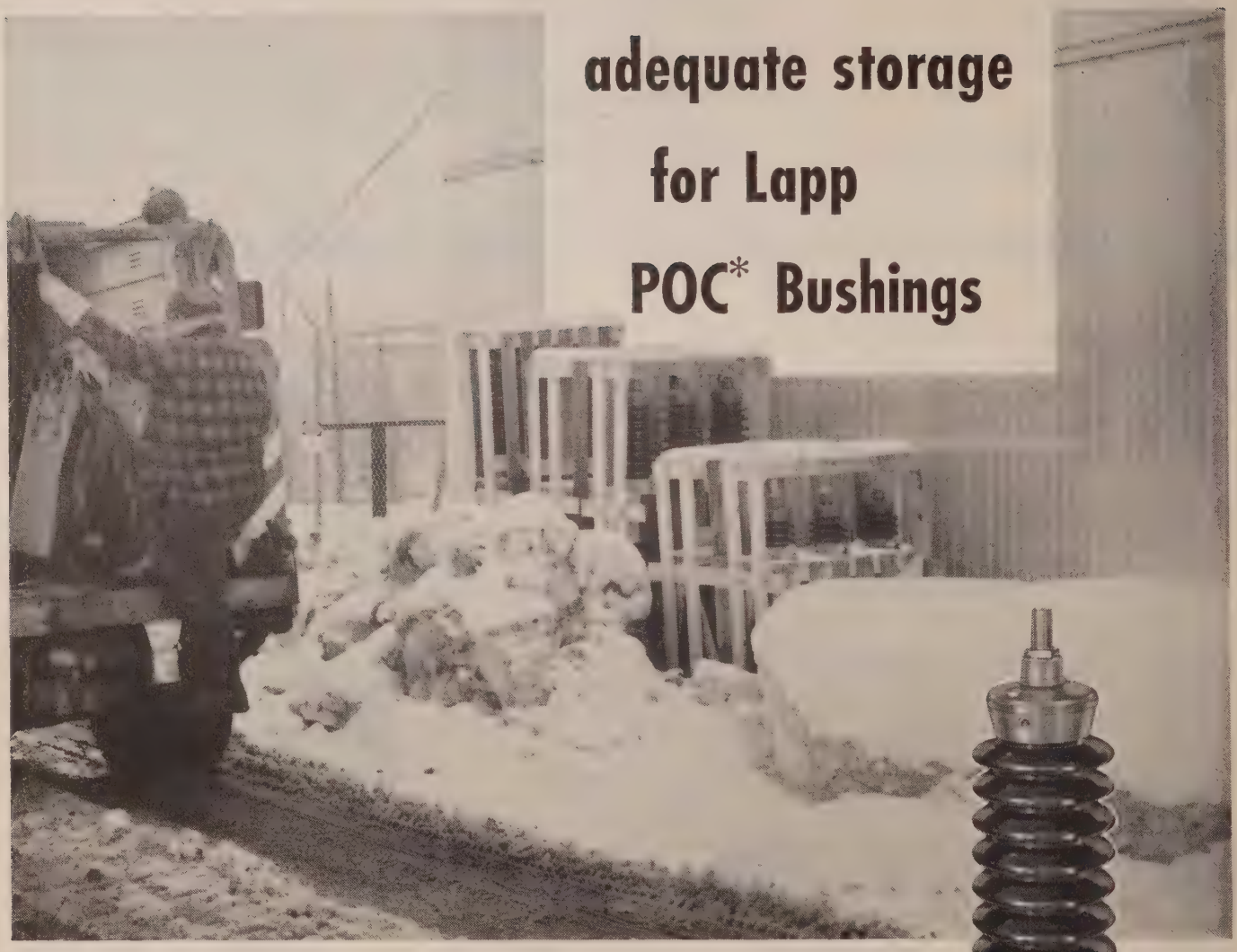
All indications point to the decade as being the Golden 60's. Design is by EL&P Art Director, Joe Schiavo.

Building for tomorrow . . .

MANUFACTURERS / PRODUCTS

. . . for more capacity

This is adequate storage for Lapp POC* Bushings



There's no special care needed in handling or storing Lapp POC* Bushings. No overhead for expensive storage space. Leave them in their crates, indoors, outdoors, wet, dry, in pole yards, even at substation sites. Weather won't hurt them over any period of time.

This is because Lapp POC* is the totally-enclosed bushing design. Its paper-oil insulated condenser core is housed and protected end-to-end. All exposed insulation is *porcelain,* including the shank. It pays off in service, too, because porcelain is inorganic . . . won't track or deteriorate under leakage current from surface contamination.

Lapp POC* Bushings meet ASA standards. Their small diameter permits their use as high-performance replacement for bushings (15 kv to 161 kv ratings) on any transformer equipment . . . new or old . . . on your system. Let us show you how you can reduce stock inventory, save on warehouse space and cost . . . and improve system reliability . . . by stocking only required sizes of Lapp POC* Bushings together with necessary flange adapters.

Lapp Insulator Co., Inc., Le Roy, N. Y.

Lapp

POC*

BUSHING

***PAPER-OIL CONDENSER TYPE**
TOTALLY-ENCLOSED CORE
ASA STANDARD

LIGHT AND POWER LINES

Philanthropic Giving By Regulated Utility Wins ommission Sanction — Praiseworthy good judgment has been displayed by the Illinois Commerce Commission in sanctioning a $260,000 contribution by the Illinois Bell Telephone Company to Chicago's Community Fund – Red Cross Joint Appeal. This Commission's finding contains important implications for many of our electric utilities.

The Commission found Chicago's Joint Appeal o be "of vital importance to the maintenance of tability of the community and to the alleviation of human needs therein."

On this premise, the Commission rejected a complaint that Illinois Bell acted illegally in contributing to the fund, plus providing some services of ts executives.

The charge against Illinois Bell was based on he argument that a monopoly utility, whose rates nd earnings are regulated, cannot be permitted to pend money for purposes remote from its business, ince its expenditures go into charges for its service. This reflects an outmoded view, as the trend of lecisions has been steadily in the direction now stablished in Illinois.

It is a healthy sign when official recognition is iven to the fact that the social and economic velfare of a community is of long-range selfish interest to the utilities serving it, their stockholders, nd their customers.

Now They're Using Watthour Meters For Tarets — Local nimrods are finding the Arizona Public Service Company's electric meters an irresistible arget for air-rifle practice.

One case reported involved a meter on a Phoenix hurch, which showed clear evidence of at least 43 shattering bullseyes through the glass cover. Amazingly, the meter was still operating.

Obviously some youngster is no respecter of church grounds when a likely target is spotted. Nor is this youngster likely to have any more respect for transmission-line insulators when he grows up and gets a high-powered rifle in his hands.

Such damage on this company's system is reported to reach a peak during children's summer vacation, with another concentrated outbreak immediately following Christmas.

Undoubtedly many other electric utilities are contending with similar juvenile vandalism. With Arizona Public Service's annual loss from this type of vandalism mounting close to $7,000, the national figure must be of serious proportions.

It is apparent that the steps urged previously to curb the dangerous and costly vandalism caused by gun-toting adults must now be broadened to cover equally thoughtless youngsters.

Safety Hats Can Become Dangerous Missiles — They take on this unhappy role when placed in the rear window of a car or truck and a sudden stop causes them to fly off the window ledge and strike the head or neck of the driver or another occupant.

It is a very natural impulse for those who wear safety hats to remove them when entering their automobiles or trucks, and to place them on such a handy shelf. However, keeping them on eliminates the danger of converting them into flying missiles and also provides valuable protection for the wearers in case of a serious collision or smashup.

John E. Garrett

Publisher and Editor

Haywood Publication

HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

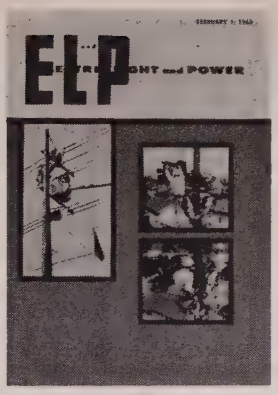
- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP and ELECTRIC LIGH

Vol. 38 Contents for February 1, 1960 No. 3

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge of 50 cents per single copy and $10 per year for domestic mailing, and $1 per single copy and $15 per year for all mailings outside the United States and her possessions. Accepted as Controlled Circulation publication at Lafayette, Indiana.

d POWER

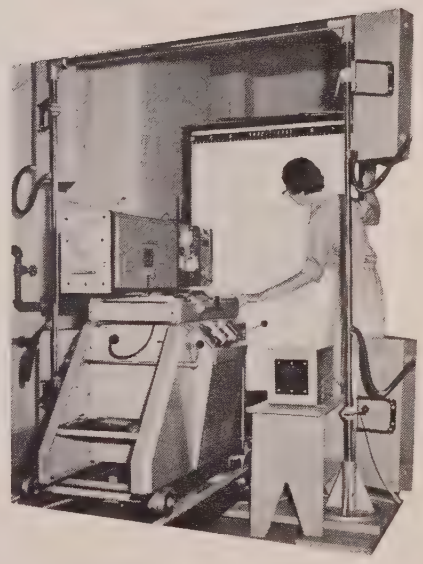


OUR COVER

Phil Klein and Al Olsen, Northern Indiana Public Service Company linemen, observe the necessary precautions of rubber gloves, sleeves, blankets, hard hats, and other safety measures which have contributed to the company's distinguished performance record in the field of safety.

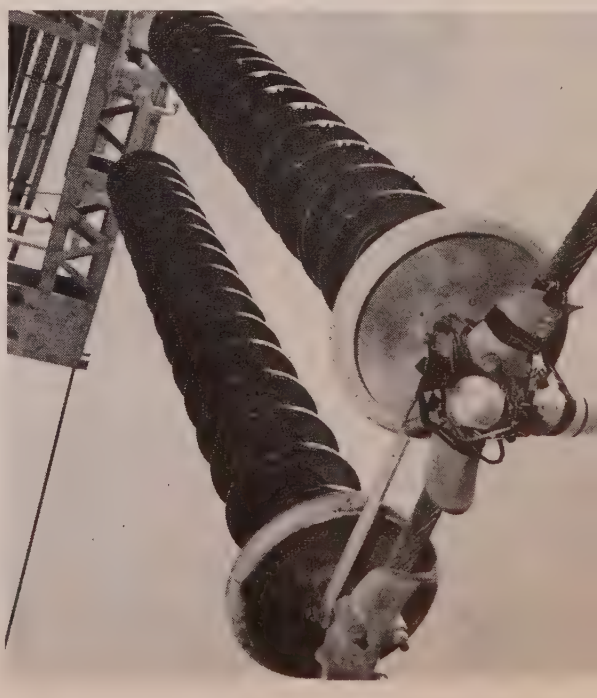
ENGINEERING / OPERATION

MANUFACTURERS / PRODUCTS



Replacement of 2600 worn tracings annually is only one of several areas where utility saves with new graphic information handling system.

Audible conductor-noise tests prove that vibration data can be telemetered and recorded through a 345-kv field.



21 Years Underground

—and still as good as new!

21 years ago, the **Niagara Mohawk Power Company** specified Burndy MOLEs for their underground modernization program. Specifications called for a connector that would perform without fault, under prolonged exposure to dampness, oils, extreme temperatures, and last the life of the cables connected. The MOLEs met all specifications, and are as good as new today ... proof beyond doubt that Burndy MOLEs have the high quality necessary for underground systems.

Utilities thruout the country have had similar long years of trouble-free experience with the MOLE ... experience that proves that the MOLE meets underground specifications for maximum dependability.

If you are considering "going underground", or expanding your present system don't take a chance on costly burnouts and disrupted service, call your local Burndy representative ... he has had years of underground experience and can help you get maximum dependability and flexibility in your underground system.

Photo from Niagara Mohawk Power's file, dated 1938, showing actual installation of MOLE in its underground system. These same MOLEs are in operation today, after 21 years of trouble-free performance.

BURNDY

59-19

ELECTRICAL CONNECTORS

LIGHT AND POWER LINES

Cooperative Research By Electric Utilities Brings Maximum Returns For The Industry—For several years now, the EEI Research Projects Committee has been building up the research sponsored by EEI with the purpose of getting more adequate coverage of those things which should be done by the industry as a whole and at the same time relieve the individual companies somewhat by more cooperative projects. This approach is so sound that the work of this committee should go on indefinitely. Moreover, its work probably will increase in volume and importance to the industry.

Next in importance in the field of cooperative utility research are projects initiated by groups of utilities confronted with problems of a more regional nature. One such project has just been inaugurated by the six power companies which comprise the Indiana Electric Association.

These utilities have entered into a contract with Purdue University Research Foundation to study the characteristics of mechanically-collected Indiana flyashes.

The six utilities participating in this endeavor are the Indiana and Michigan Electric Company, Indianapolis Power & Light Company, Northern Indiana Public Service Company, Public Service Company of Indiana, Inc., Southern Indiana Gas & Electric Company and Mooresville Public Service Company, Inc.

The research program will be undertaken in two phases. The first phase of the program, which is estimated to cost $9000 and which should be finished by mid-1961, will comprise two studies. The first study will determine how the physical and chemical properties of the various mechanically-collected flyashes in Indiana differ from the electrostatic flyashes now being used extensively as admixtures in concrete. The second study will determine the effect of these characteristics upon the pozzolanic properties of the flyash.

The second phase of the program will be made essentially to determine how the Indiana flyashes can best be utilized in concrete and for other useful purposes. The exact extent of the second phase of the project has not been determined as yet and will be influenced largely by the results obtained in the first phase.

Findings from this Indiana flyash research project may have considerable value to utilities in other sections of the country. Likewise these Indiana utilities stand to benefit from research endeavors on a national scale.

Those Missing Billions In Tax Revenues From Electricity Sales—For the 17-year period 1942 through 1958 electricity supplied to customers of presently tax-exempt organizations, if sold by taxpaying companies, would have yielded $2.7-billion to the Federal treasury. Projection of similar tax yield for the next 17 years shows that $11.5-billion would flow to the Federal treasury which it will not receive under the present tax-exempt situation.

So stated E. Roy Gilpin, of the New York firm of Reid & Preist, in a statement presented before a recent meeting of the Committee on Ways and Means of the House of Representatives.

These simple but eloquent statistics are ample demonstration of what tax equalization, or lack of it, means.

Publisher and Editor

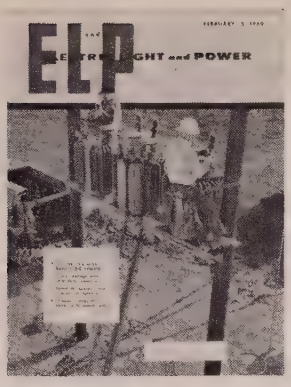
HAYWOOD PUBLISHING COMPANY
PUBLISHERS OF:
- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP and ELECTRIC LIGH

Vol. 38 Contents for February 15, 1960 No. 4

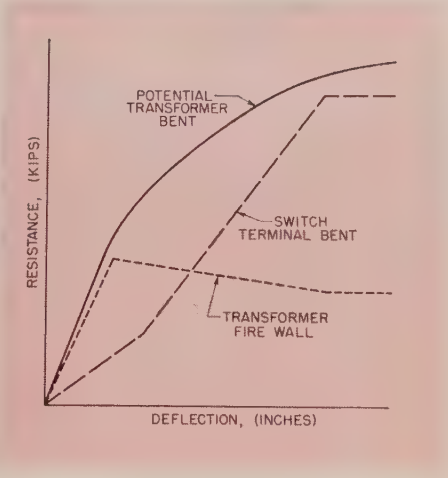
ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis t executives and department heads of: electric light and power companies; municipal electric organiza tions; rural electric cooperatives; Federal power administrations; engineering and management servic companies serving the electric utility field; consulting engineers; and companies specializing in electri utility construction throughout the United States and her possessions. To all others there is subscription charge of 50 cents per single copy and $10 per year for domestic mailing, and $1 pe single copy and $15 per year for all mailings outside the United States and her possessions. Accepte as Controlled Circulation publication at Lafayette, Indiana.

d POWER



OUR COVER

Carolina Power & Light crew busily at work installing two 110-kva and one 167-kva transformers to serve Carolina Sportswear Company, Inc., at Warrenton, N. C. This plant is all-electric, with heat pumps for both summer and winter "climatizing."

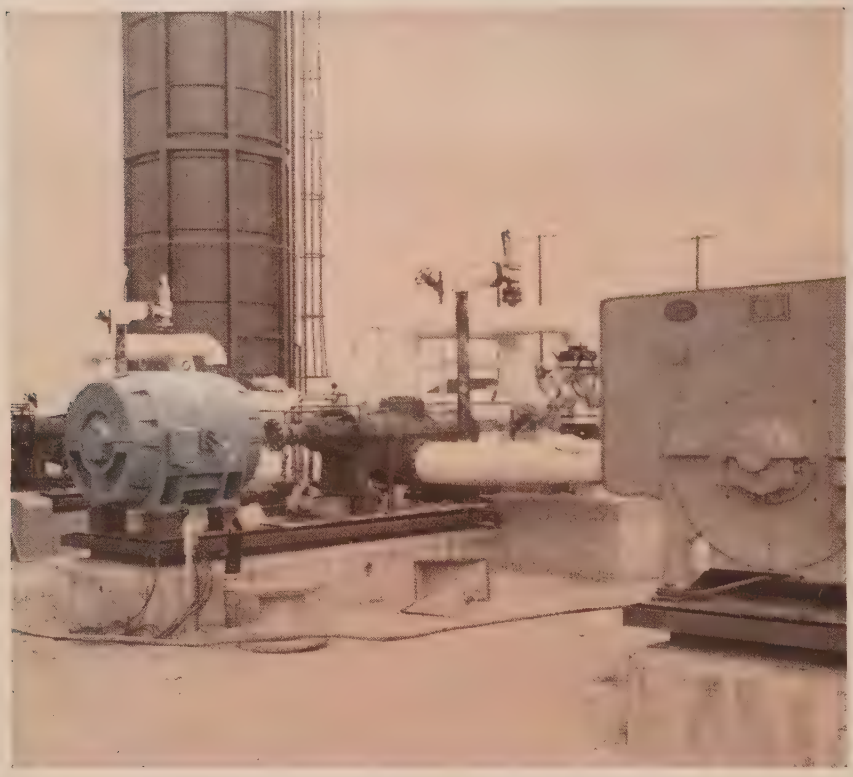


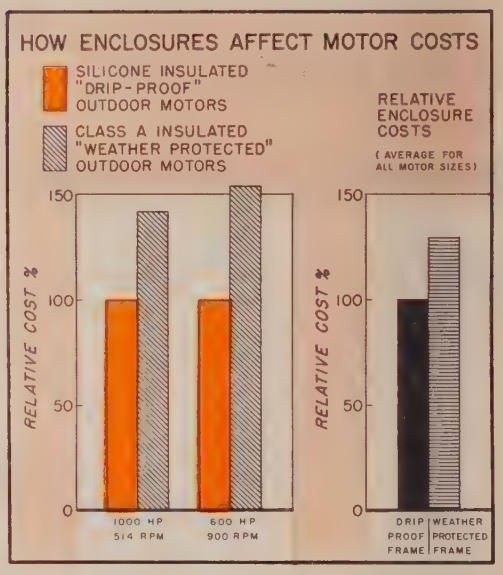
Deformation of power plant components from nuclear blast, and recovery time can be predicted . . .

Tellurometer is effective up to 40 miles for transmission line surveying . . .

MANUFACTURERS / PRODUCTS

Banish Costly Enclosures





Save on Outdoor Motors by Specifying Silicone Insulation

Dramatic proof of size and weight savings made possible by motors with silicone insulation systems is demonstrated by these outdoor direct coupled pump drives at the Alamitos Steam Station of Southern California Edison Company. Here, self-protecting silicone rubber insulation means substantial dollar savings in enclosure cost for the smaller, open frame motor.

Both motors have 400-hp ratings. The difference in weight between the two motors is well over 1,000 pounds. Why is one motor so much larger than the other? Because the smaller Allis-Chalmers motor has a self-protected Silco-Flex insulation system incorporating Silastic®, the Dow Corning silicone rubber. The other motor is insulated with conventional materials requiring the protection of a more elaborate enclosure.

Despite its much smaller size, the silicone insulated motor also has a 15% service factor not found in the larger unit. This extra cushion against overloads assures greater reliability and longer life for the smaller unit.

Silicone rubber insulated motors for pump drives, fan drives, or other applications can withstand torrential rains, corrosive fumes, fly ash, dust, salt air, snow, sleet, cold, heat . . . even flooding! That's why it's wise to specify motors with insulation systems made from Dow Corning Silicones for greater reliability and maximum savings.

For more information, write Dept. 1402.

Savings of 30% and better result from specifying motors with insulation systems made from Silastic. Silicone rubber produces a homogeneous, resilient insulation system unaffected by heat, cold, moisture, abrasives, many chemicals and corrosive atmospheres. No need to buy expensive enclosures. Insulation systems made of Silastic are self-protecting, permit open enclosures outdoors where weather-protected frames would otherwise be required. There's no need for a premium priced enclosure to protect the insulation.

What's more, Silastic's extra thermal capacity provides motors, transformers, and other equipment with additional service factor for absorbing overloads. These motors — with a generous service factor *built-in* — add immeasurably to reliable service . . . operate more economically.

SPECIFY Dow Corning Silicones and **SAVE!**

first in silicones

Dow Corning CORPORATION
MIDLAND, MICHIGAN

ATLANTA BOSTON CHICAGO CLEVELAND DALLAS LOS ANGELES NEW YORK WASHINGTON, D. C.

LIGHT AND POWER LINES

Needed From Civilian Inventors: Solutions To Some Of Our Armed Forces' Technical Problems—If any of our utility engineers have suggestions for solution of the many hundreds of technical problems which now handicap our Armed Forces, the National Inventors Council, U. S. Department of Commerce, would like to hear from them.

Although it is quite unlikely that ready answers will be forthcoming because of the very special nature of these problems, no possibilities should be overlooked.

A new list of 300 problems presenting challenges in almost every field of science and technology was recently released by the Council. This list may be obtained on request from NIC, U. S. Department of Commerce, Washington 25, D. C.

In the field of rocketry, for example, there is urgent need for a power source other than nuclear that will not require refueling on long space flights, and a one-shot, lightweight structure made of something other than metal. Control systems, a major source of missile failures, must be improved, and so must guidance systems.

Military mechanical engineers are looking for ideas for such things as lightweight laundry equipment that uses little or no water; a device to boil a bucketful of water in five minutes; noise suppressors for jet engines; seals to prevent gas leakage at exceedingly high pressure and heat.

In electronics, improved transistors and microwave oscillators are required, as are self-activating spare electronic components to go into operation automatically as other parts fail.

"Since 1940," says John C. Green, executive director of the Council, "the NIC has been advising civilian inventors of problems standing in the way of national defense developments, evaluating proposed solutions from the inventors, and turning promising ideas over to the proper military agencies. Through the Council have come many important inventions and ideas which have saved lives, money, and manpower, and have improved our armaments."

An Assist For A Utility's Visitors—One of our electric utilities has developed a small "welcome" leaflet for visitors to its various offices that is sufficiently unusual to warrant special mention here.

Conspicuously available in the Atlantic City Electric Company's waiting rooms is a small folder titled "Glad You Came In Today" which not only extends a warm welcome to visitors but provides interesting and helpful information for the company's visitors.

Under "Persons You May Wish To See" are listed names and titles of company officers, division managers and district managers, to avoid possible confusion.

Then comes a very brief resume of the company's background, its status today, and its plans for tomorrow.

Over the president's signature appears this concluding statement:

"We want you to have every courtesy and attention while you are visiting us, and to leave feeling satisfied and fully accommodated. Any suggestions for improvement of the reception afforded you, therefore, will be most gratefully received."

Here is a commendable idea to help smooth out and improve any utility's relations with its visitors, particularly the general public.

John C. Garrett

Publisher and Editor

HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP and ELECTRIC LIGHT

Vol. 38 Contents for March 1, 1960 No. 5

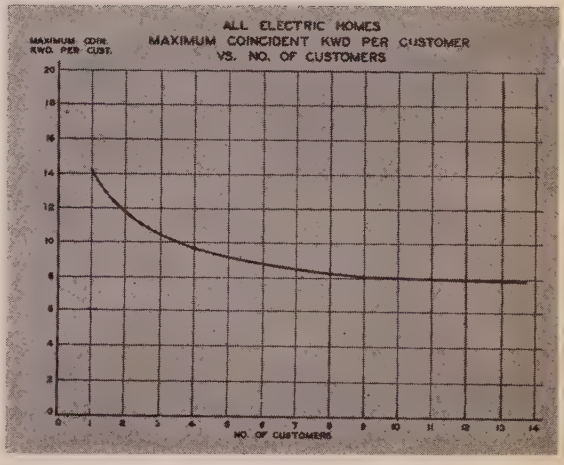
ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge of 50 cents per single copy and $10 per year for domestic mailing, and $1 per single copy and $15 per year for all mailings outside the United States and her possessions. Accepted as Controlled Circulation publication at Lafayette, Indiana.

ıd POWER

OUR COVER

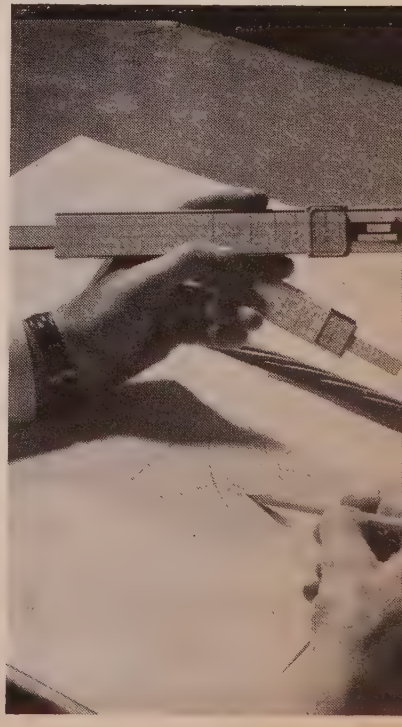
Light utility helicopter (Hiller Aircraft) lifts a reel of power cable. To meet growing needs during its lifespan, owner can expand the 3-place helicopter in power and size. Crane helicopters, says Sikorsky, will soon carry 20-ton payloads for 50 miles . . . and 50-ton loads by 1970.

ENGINEERING / OPERATION



Utilities must know characteristics of all-electric loads of future to serve economically.

Accurate solutions to sag problems are reached quickly by operating two slide rules at once.

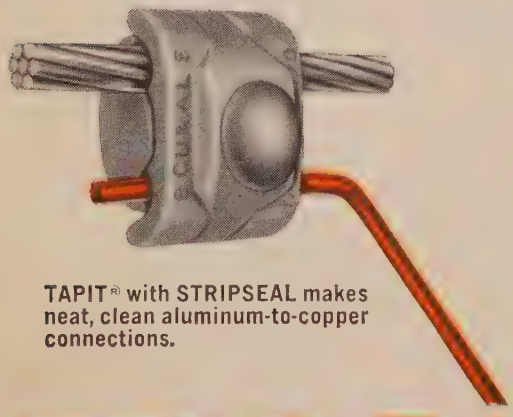


MANUFACTURERS / PRODUCTS

STRIPSEAL

seals in oxide-inhibiting PENETROX®
...on the connector contact surfaces

No Cutting...No Snipping or Ripping...Just a Gentle Pull



TAPIT® with STRIPSEAL makes neat, clean aluminum-to-copper connections.

and your Burndy STRIPSEALED connector is ready to make a trouble-free aluminum connection. STRIPSEAL, the leak-proof, all-weather, plastic cover hugs the connector like a "cocoon"...seals in oxide-inhibiting PENETROX—on the contact surfaces, where it belongs. **It's easy to use**...even with work gloves on. **It's clean**...just dry brush conductor and install the connector; no on-the-job application of oxide inhibitor needed. **It's sure**...lineman can't forget PENETROX. For positive protection of every connection, specify Burndy connectors with STRIPSEAL. Write for full details.

BURNDY

59-18

Norwalk, Connect. In Europe: Antwerp, Belgium Toronto, Canada

LIGHT AND POWER LINES

Those Indictments Must Not Be Allowed To Disrupt Marketing Relations Vital To Our Industry's Operations—Last month some of the most valued and respected suppliers to the electric utility industry found themselves in a predicament which they themselves viewed with "shock" and "distress." A forthright description of the industry's reaction to the predicament would undoubtedly match, in concern and regret, that of the accused.

The indicted firms and their accused employees are already penalized—through loss of prestige and position—far beyond the penalties which may be imposed by the Federal government. There is little if anything to be gained by their customers at the expense of the unfortunate situation in which these manufacturers have been placed.

Can there be any constructive outcome from the incident (or incidents)? A more than obvious conclusion might be the assumption that the market for electrical equipment will become more competitive, more "free enterprise," more productive in terms of the public good."

However, where it may be possible to show in specific instances that such is the result, the measurable benefits which may accrue to customers of the manufacturers or the general public will more than likely be less than significant. At the same time, substantial damage could be done to the industry's marketing machinery and relations, if the blame that is due some suppliers in some situations is ascribed in a promiscuous manner to the established and effective ways of doing business in this industry.

At the risk of being numbered among those who can in any dilemma cry: "Now is the time for all good men . . .," we do suggest that this regrettable situation can be turned to good if there is more striving to meet conditions such as these—

1. If in the thinking of businessmen there is a greater sense of responsibility—that would contrast with the premise: what is good for the corporation is best for the public.

2. If in the industry's marketplace there are concessions by both seller and buyer to each other . . . to achieve an orderly improvement of conditions, while avoiding the violent shockwaves that abuses develop . . . As for marketing concessions, for example, suppliers to the utility industry would do well to consider more seriously the desire for pricing reflections of volume buying and "economies and differentials in marketing operations," as expressed most recently in a utility buyers' conference. Then, on the part of utility buyers, the pleas of manufacturers for cooperation in "advance" or "trend" buying to help create a more orderly supply situation should certainly not go unheeded.

Utility customers of the electrical equipment manufacturers readily agree that they **must** afford healthy, profit-making suppliers . . . that they **can not**, in the long run, afford "White Sale" marketing to characterize business practice in this industry. This is more practical economics than "ethics," though a measure of the latter is essential, too.

And now, more than ever before, the utilities can count on the electrical equipment manufacturers to supply them with more than just better products year-after-year. Accused, the industry's biggest manufacturers express anew the important guarantees of competitive enterprise which we all must concede are essential in our way of life.

John Garrett

Publisher and Editor

HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

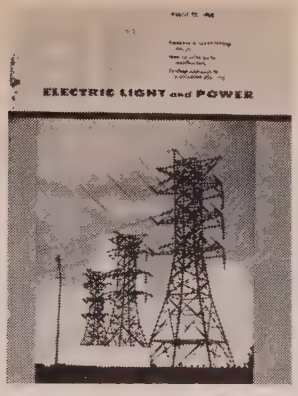
- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP and ELECTRIC LIGH

Vol. 38 Contents for March 15, 1960 No. 6

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge of 50 cents per single copy and $10 per year for domestic mailing, and $1 per single copy and $15 per year for all mailings outside the United States and her possessions. Accepted as Controlled Circulation publication at Lafayette, Indiana.

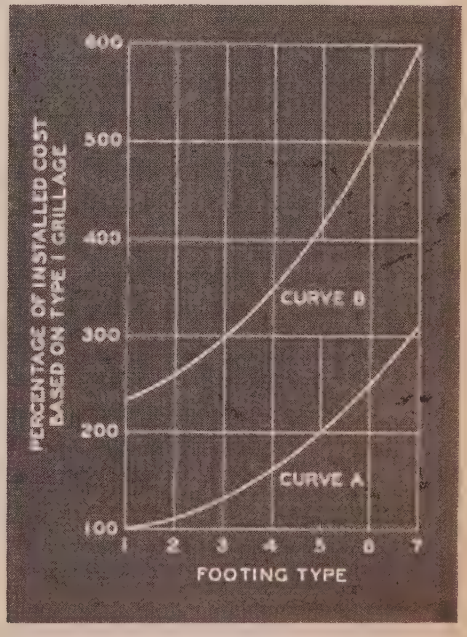
d POWER



OUR COVER

Dave Binns, a freelance photographer from Florida, was struck by the stately solidarity of these transmission lines and towers. We felt it would make a good cover photo . . . Don't you agree?

Moving huge pieces of equipment requires meticulous planning and timing.



Installed cost relationship for various tower footings all designed to support the same load.

When the heat's on...

ROEBLING TELLURIUM LEAD ALLOY SHEATH IS STEADY AND STABLE!

Wiping operations raise sheath temperatures up to 400° F. Stable sheath is what you need when the heat's on! And Roebling's Tellurium Lead Alloy Sheath retains its remarkable creep resistance and bending fatigue resistance under intense heat, and after it.

What's more, there's extra life built into the carefully made paper power cable *inside*. That's why there's simply no better cable buy when it comes to long life, dependable service, minimum maintenance.

Interesting test and other data are now available. Write today for your free copy of the booklet that shows the way to reduced cable and maintenance costs. Electrical Wire, John A. Roebling's Sons Division, Trenton 2, New Jersey.

ROEBLING

Branch Offices in Principal Cities
John A. Roebling's Sons Division, The Colorado Fuel and Iron Corporation

Roebling electrical wires and cables are available with either copper or aluminum conductors.

LIGHT AND POWER LINES

Continued Growth Through Continued Reading—Never before has the young engineer's advancement been so dependent on consistent reading that broadens his viewpoint and keeps him abreast of developments in his own field.

No one has stated the case more concisely than did Francis Bacon in his famous quotation:

"Reading maketh a full man; conference a ready man; and writing an exact man. And, therefore, if a man write little, he had need have a great memory; if he confer little, he had need have a present wit; and if he read little, he had need have much cunning, to seem to know that he doth not."

It is sheer folly for any young engineer to take the attitude that because of the heavy demands on his time he just doesn't have time for serious reading anymore.

Admittedly the reading material now available to the young engineer is so voluminous that he must exercise discrimination in his selection of reading material. But it is a sure bet that if he can't manage to find time for reading that will keep him informed and make of him "a full man" he will never progress beyond the routine of his present job.

Writing Ability Can Make The Difference—Young engineers who have acquired the ability to turn out lucid, coherent papers and reports are so much in the minority today that their rapid advancement professionally is practically assured. On the other side of the ledger we find the many young men who appear blissfully unaware that lack of this ability can make the difference between a tremendously successful career and a very mediocre one.

Educators and business leaders alike are exhibiting increasing concern over the marked inability of many young engineers to write grammatically, spell, or punctuate correctly.

Bright young men entering industry's engineering programs today possess a high degree of facility in basic mathematics. However, a disturbing percentage of them are sadly lacking in ability to use language as a tool for reasoning and communicating.

One of our prominent educators, Dr. Eric A. Walker, president of Pennsylvania State University, has stated his conviction that this situation will not change until the professors—**all** the professors of **all** the courses—establish certain minimum standards for the students' written work and then make it clear to the students that violation of those standards is just as serious as violation of the basic principles of mathematics.

Dr. Walker says further that a program of this sort, if carried out conscientiously by the faculties of our engineering colleges, would soon make engineers the most literate of all professional groups in American today.

Failure to stress writing capacity early enough in the educational process has also been cited as a major cause of poor writing. Further, that the greatest trouble is with the written word—putting it down on paper. A college dean is quoted as saying, "You will find men who are very articulate orally who are shockingly incompetent in writing properly."

This situation is not likely to improve until aspiring young engineers are somehow made to realize the profoundly adverse effect that lack of writing skill can have on their own advancement professionally. And, most importantly, they must have the will and tenacity to do something about it.

John Garrett

Publisher and Editor

Haywood Publication

HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP and ELECTRIC LIGH

Vol. 38 Contents for April 1, 1960 No. 7

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—$10.00 per year; other domestic subscribers—75c per single copy or $15.00 per year; Canadian and foreign subscribers—$1.50 per single copy or $20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

OUR COVER

Artist Ted Schroeder's interpretation of the development of the modern engineer-scientist was originally created for the front cover of THE BRIDGE of Eta Kappa Nu, electrical engineering honor society, and is reproduced on our cover by special permission .

POWER

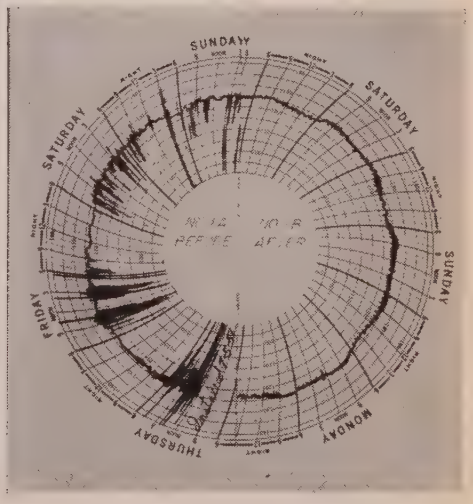
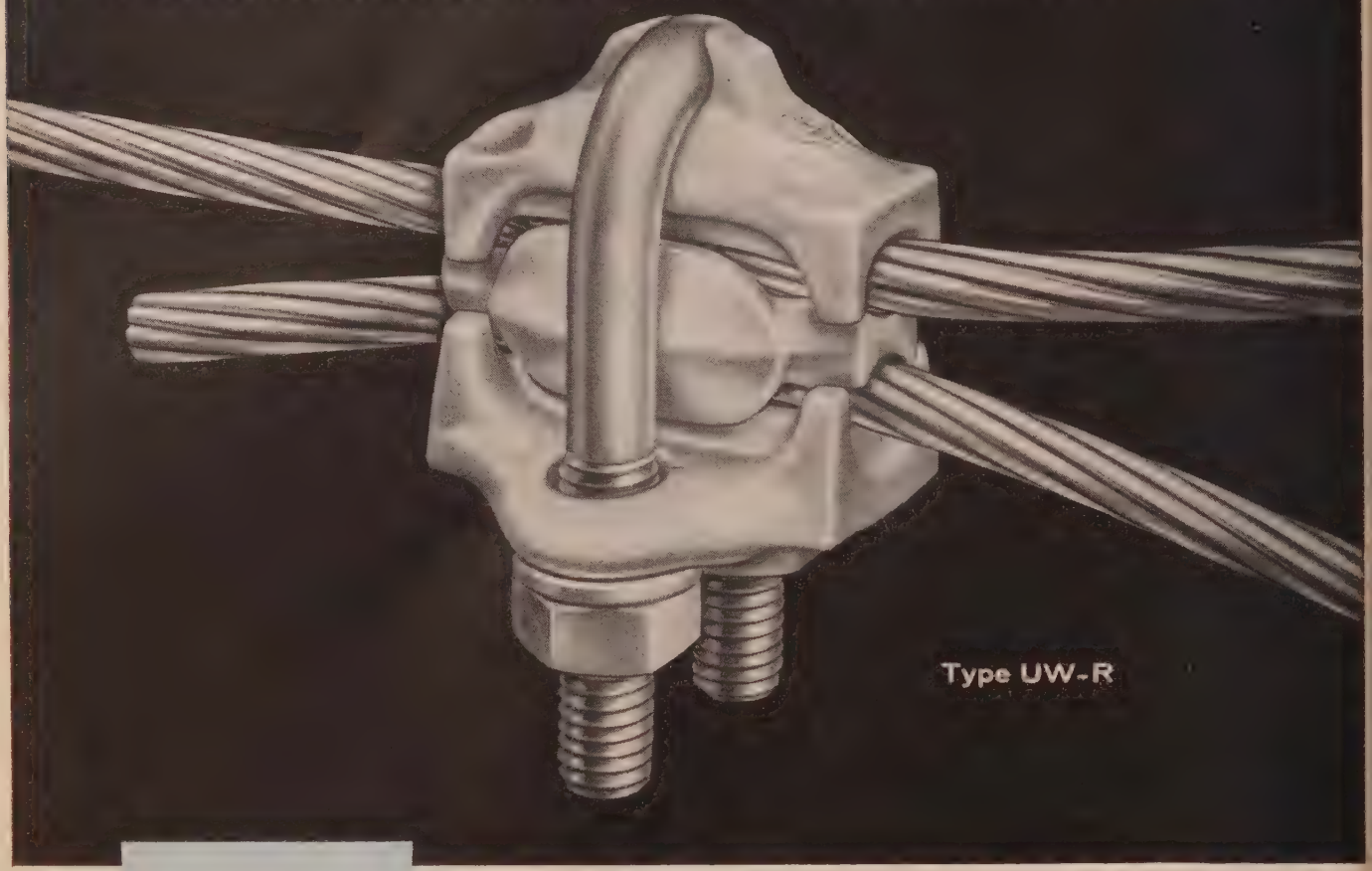


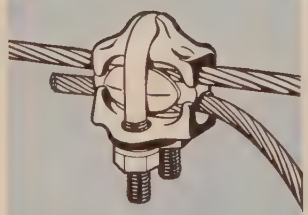
Chart shows improved voltage condition on 12-kv feeder after installation of series capacitor.

Contractor's price reflects his safety record.

CLIPIT

low cost DEADEND for ACSR and Aluminum





Generous wrap-around CLIPIT spacer, coated with corrosion inhibiting compound, assures good conductivity when using CLIPIT as a tap connector

The high strength aluminum alloy CLIPIT deadend offers low cost, easy installation, wide range and versatility.
For reliable field performance, the CLIPIT, type UW-R, has these engineered features:

- Wide cable range: 2 sizes cover #6 thru 2/0 aluminum or 1/0 ACSR.
- High holding strength—CLIPITS exceed rated breaking strength of ACSR on most sizes.
- All parts of the CLIPIT are mutually self aligning.
- Captured, high strength, galvanized steel U-bolt permits high tightening torque.
- Wide belled cable entrances of CLIPIT reduce stress points and minimize cold flow. Ears of caps confine cables, prevent splaying.

CLIPIT— *another engineered solution to your connector problems by*

BURNDY

BURNDY, Norwalk, Connect., or Toronto, Canada...in Europe: Antwerp, Belgium

58-13

LIGHT AND POWER LINES

There Can Be No Neutrals In The War On Acci-ents—"Either you help with the solution or you ecome part of the problem."

This thought, expressed in a recent issue of the Vestern Union Safety Bulletin, is an apt reminder of ie great importance of keeping everyone constantly n the act," as it were, in utility efforts to prevent cidents.

As an example of this, a number of utilities have ound that daily contacts between safety and claim eople and publicity and information personnel is ighly beneficial to all concerned. On the other and, it has been observed that even though many ilities have found that a good accident prevention olicy makes for good public relations, some do not ave very close liaison between these two departments.

One evidence of an intimate working relationship this nature is to be found in utility annual reports hich include written and pictorial reference to acci-ent prevention efforts. A recent analysis of 54 annual eports, made by Arthur Naquin, present chairman the EEI Accident Prevention Committee, disclosed iat 35 of them included both written and pictorial eference to these important efforts. Only four made either written nor pictorial reference to accident revention activities within their organizations.

EEI's Accident Prevention Committee is making serious, nationwide attempt to reduce fatalities in ie industry, particularly those caused by electric ontacts. There are many facets to the program, one f them being the preparation of a uniform safe work ractices manual.

Men who devote all of their time and talents to ie prevention of accidents have found that accidents ill occur after all known protective devices have een furnished, all manner of gimmicks have been used and every practical rule has been written. In analyzing this condition, they have found that the attitude of the individual can nullify all known practices designed for the prevention of injury or death.

Attitudes can be influenced either for good or bad. Attitudes are affected by what is seen and read. The human animal is often lazy. He is also inclined to be perverse. Again, it may be a matter of mistaken effort to increase production at the expense of safety. Whatever the reason may be, a picture or story, which is different from the instructions a man has received, will be enough excuse for someone to short cut a safe practice.

All of this points up the importance of close attention by publishers of magazines serving the electric-utility field, and by those advertising therein, to the danger of inadvertently picturing practices contrary to those recommended by the EEI Accident Prevention Committee.

The year 1958 was the first which showed a material reduction in fatalities within the utility industry due to electric contacts. The problem, as recognized by the Committee, is that they have "skimmed the cream off the top." Any further reduction in the number of accidents and fatalities will require much greater effort, a much wider acceptance of responsibility, and the active assistance of everyone connected with the industry.

John Garrett

Publisher and Editor

HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP and ELECTRIC LIGHT

Vol. 38 Contents for April 15, 1960 No. 8

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—$10.00 per year; other domestic subscribers—75c per single copy or $15.00 per year; Canadian and foreign subscribers—$1.50 per single copy or $20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

d POWER

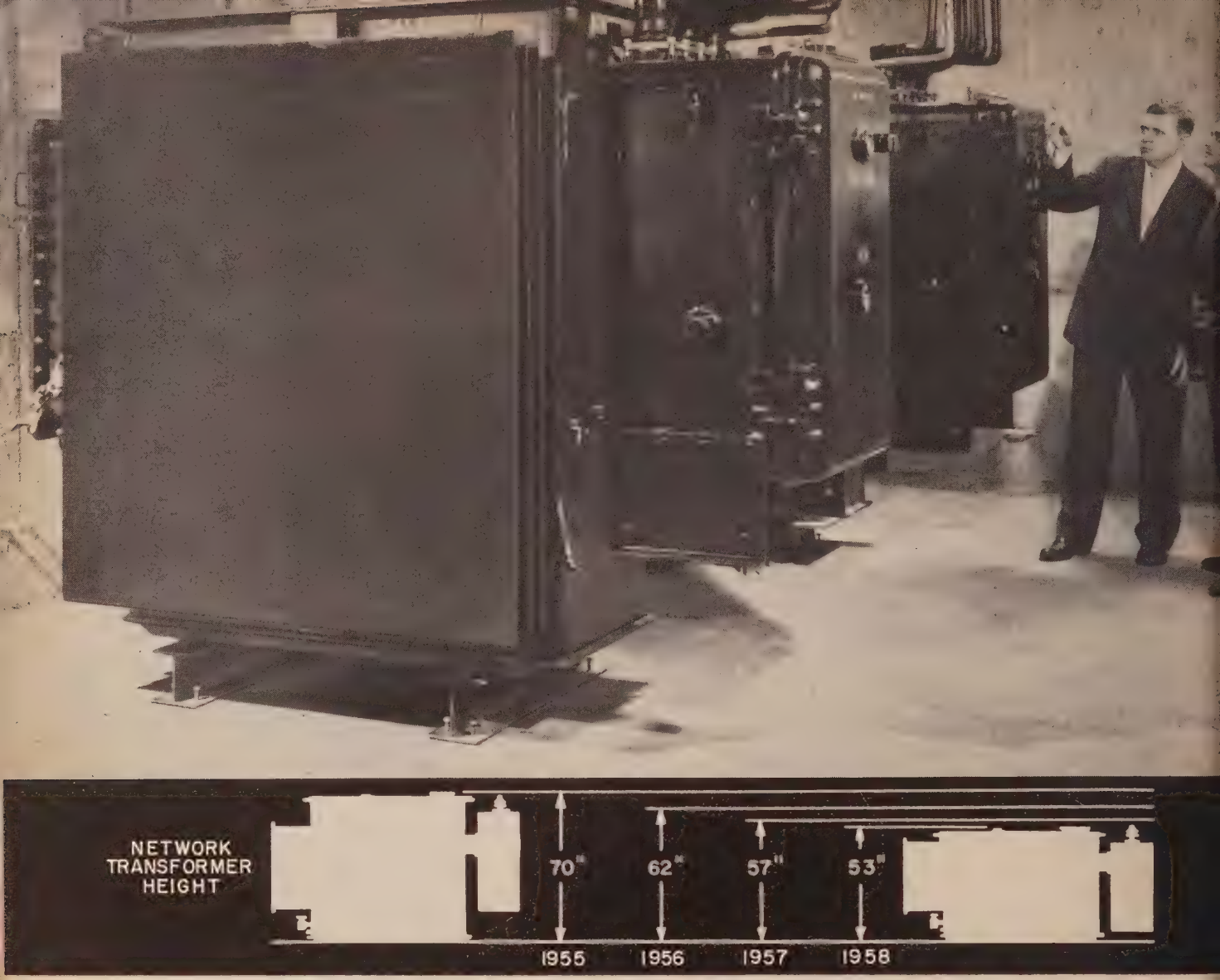
OUR COVER

Largest-diameter ACSR transmission conductor ever fabricated, this experimental 2.32-in. cable designed for use on Project BHV and Penelec's 460-kv test lines is here strung on Alcoa's test towers at Massena, New York. Designed by Alcoa, this test-run quantity is now being evaluated. Quantity production is expected this spring.

Painting transformers in place cuts maintenance costs.

On a life-cost basis metal crossarms are most economical for 230 kv.

MANUFACTURERS / PRODUCTS



Utility and G-E engineers inspect recent Vaultmaster transformer installation. Insert shows dramatic size reductions—totalling 24%—made on 500-kva, 15-kv network transformer since 1955.

General Electric network transformers combine new features, old reliability to pace utility requirements

Not by tradition alone has the General Electric network transformer held its unquestioned rating as the No. 1 choice of the nation's electric utilities. Utilities know that *continuous* design innovations—backed by in-service reliability—keep the G-E "Vaultmaster" ahead of the field. For example, look at these major improvements made to G-E network transformers in the past 18 months:

- **Wound Evans Core** (July, 1958)—This important development utilizes the famous G-E Spirakore* core and results in a core-and-coil that has improved characteristics, yet is smaller and lighter.

- **"Sandwich" Paint Finish** (October, 1958) Melaprene, the best paint yet found to combat corrosion damage to network transformer finish, is applied *between* the primer and finish coats to provide extra-long finish life—altogether, five paint coatings are applied compared to three coats on other network transformers.

- **Alumina Bushings** (March, 1959)—The goal of a hermetically sealed network transformer was brought one step closer with this major advance. It eliminates the need for gaskets while reducing the throat height of the Vaultmaster unit by four to six inches.

- **Nitrile Gaskets** (November, 1959)—Both the high- and low-voltage ends of G-E network transformers are now protected by nitrile rubber gaskets—superior in sealing ability and reusable without requiring cement or other adhesive.

Thinking of a network installation this year? If so, be sure you have kept up with network-transformer advancements by keeping in touch with your General Electric Sales Engineer. Or, write for Bulletin GEA-5024 to Section 484-01, General Electric Co., Schenectady 5, N. Y.

* Reg. Trade-mark of General Electric Co.

Progress Is Our Most Important Product

GENERAL ELECTRIC

LIGHT AND POWER LINES

Let's Make This Decade "The Electrifying Sixties"—ur industry has much to gain if every segment of it ould adopt and publicize "The Electrifying Sixties" as e name for the period ahead. If this were done there a good chance that this name would soon come into ommon use by people outside our industry, with obously beneficial connotations.

Credit for this idea is due Ralph Sorenson, manager the Utility Sales Department of Westinghouse's Elecic Appliance Divisions.

Various other names now being used for the present ecade, such as "The Soaring Sixties," "The Golden xties," and the like, portend a period of accelerated dvancement and prosperity but lack the implication of ectricity's role in bringing this about.

All of us have come to accept the saying, he's "cookg with gas," to express the feeling that a person is oing a good job. Thus it is not at all unlikely that "The lectrifying Sixties" could gain equally wide acceptnce through united effort by our industry.

We invite comments on this idea from any of our aders and will be glad to publish them for our mutual enefit.

"Scientists Make It Known, But Engineers Make It ork"—This theme, used in a series of public service vertisements by Engineers Joint Council during last ar (carried in "Editor & Publisher," business magane for the newspaper profession), is deserving of comendation by our industry. It has served to clear consion between the terms "scientists" and "engineers," equently used interchangeably by news writers.

EJC's ads were designed to create better understanding of engineers and engineering by printed media, radio and television, public officials, organizations and advertising agencies. They carried such eye-catching titles as "Let's Get Clear On What Engineers Do," "Just Who's Firing Those Missiles," and "Say Engineer When You Mean Engineer."

As one person writing to EJC in this regard commented, every engineer should become a missionary on this theme.

A Further Accomplishment Through Engineers Joint Council—Individual members of the Societies in EJC have long desired some means of knowing what EJC is doing and preparing to do in advancing the best interests of the Societies and the profession. This has now resulted in publication by EJC of "Engineer," a four-page miniature newspaper. Its Volume 1, Number 1 issue is dated "Spring, 1960."

According to EJC, this publication will be the means eventually of giving word to all engineers everywhere of the steady advancement of the engineering profession. This is a big order, when it is considered that EJC is a federation of 21 national engineering societies, representing 300,000 engineers.

Through EJC, the nation's engineers bring their constructive thoughts to bear on national manpower policy, on engineers' employment conditions in industry, on science and engineering education, on secondary and technical school education, on national resources policies, on international standards, on labor-management relations or in developments such as nuclear energy.

Our industry has a big stake in EJC's activities and its new publication should contribute importantly to our awareness and understanding of its efforts in behalf of all of us.

Publisher and Editor

a Haywood Publication

HAYWOOD PUBLISHING COMPANY

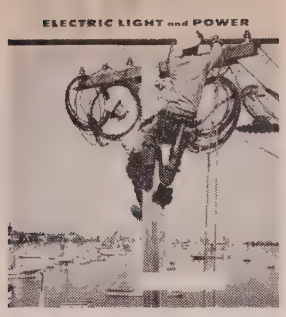
PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP and ELECTRIC LIGHT

Vol. 38 Contents for May 1, 1960 No. 9

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—$10.00 per year; other domestic subscribers—75¢ per single copy or $15.00 per year; Canadian and foreign subscribers—$1.50 per single copy or $20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

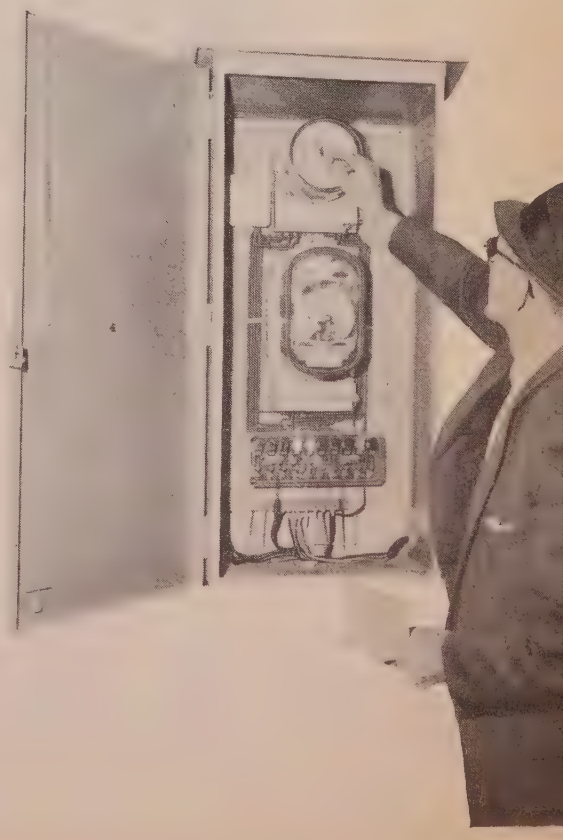


OUR COVER

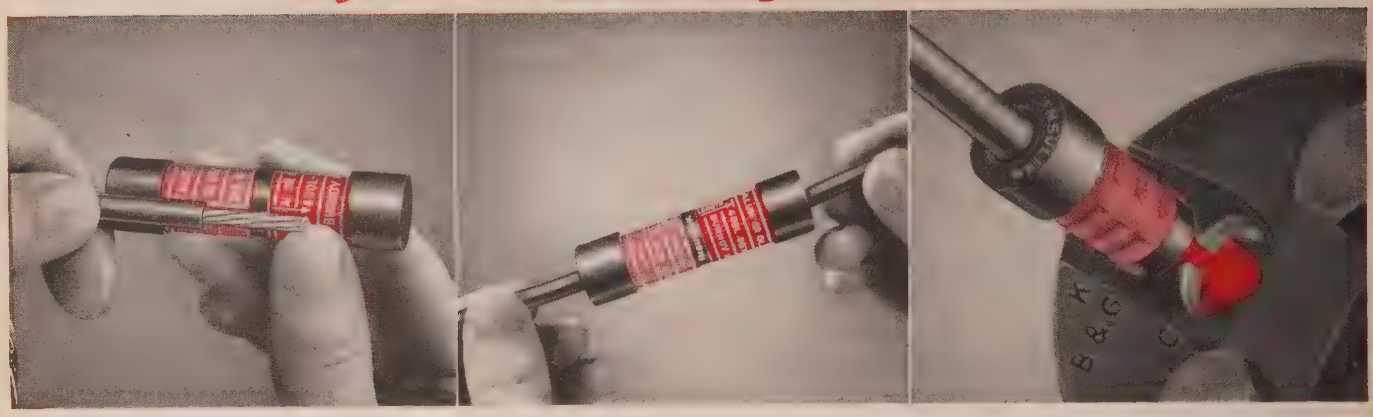
It is seldom that linemen have as picturesque a setting for their work as do these Pacific Gas & Electric Company linemen working on a pier at the Monterey, California, yacht harbor.

How risk deteriorates over two year period when generator is needed but not added.

"Bird Dog" var meter indicates where additional capacitors are needed and tells where too many were added by guess.



Quick...Easy...Sure



STRIP back cable insulation...arrows on INSULINK show how far.

INSERT wire ends; **caps grip and hold cable,** both hands are free for crimping.

CRIMP with standard compression tool... guide lines on INSULINK show where.

Pre-insulated

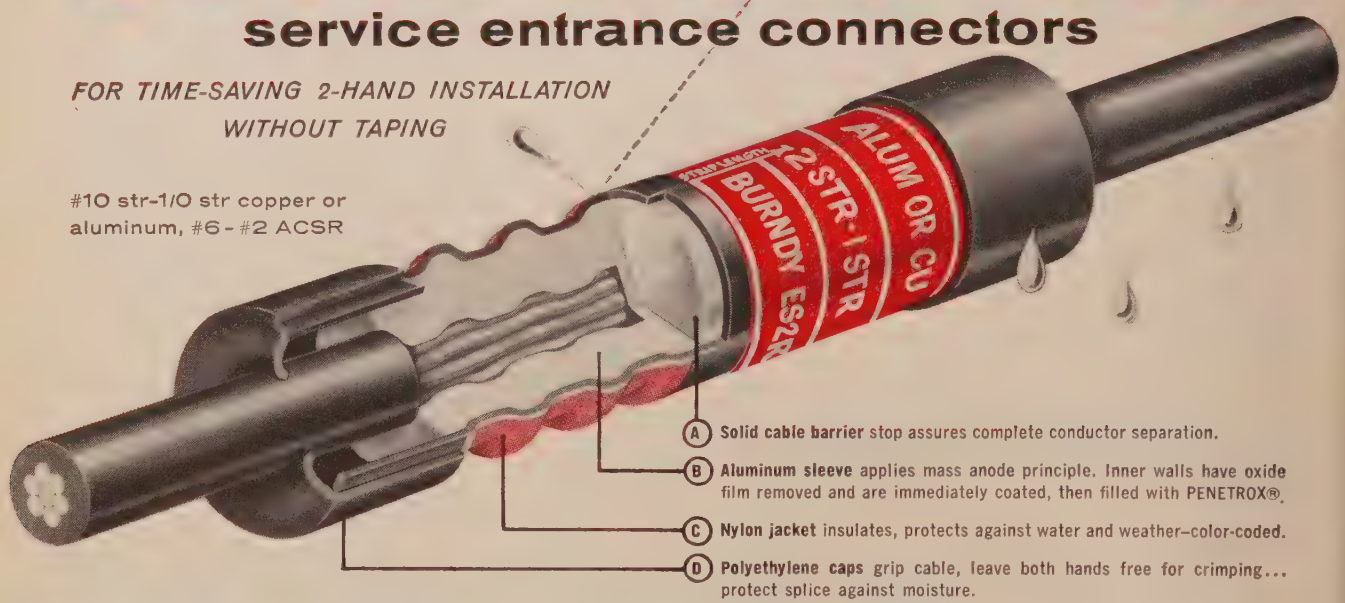
INSULINK®

Patented Other Patents Pending

service entrance connectors

FOR TIME-SAVING 2-HAND INSTALLATION WITHOUT TAPING

#10 str-1/0 str copper or aluminum, #6-#2 ACSR



(A) **Solid cable barrier** stop assures complete conductor separation.

(B) **Aluminum sleeve** applies mass anode principle. Inner walls have oxide film removed and are immediately coated, then filled with PENETROX®.

(C) **Nylon jacket** insulates, protects against water and weather–color-coded.

(D) **Polyethylene caps** grip cable, leave both hands free for crimping... protect splice against moisture.

Connect service entrances with much less effort, in less time, **without taping.** INSULINK pre-insulated compression connectors are installed in three simple steps with the same crimping tools and dies used to install uninsulated connectors...for time-saving economy...for neat, fully protected, electrically stable connections. INSULINK connections are

QUICK: because there's no taping.

EASY: color-coded connector jacket clearly marked to show cable ranges, strip length, where to crimp. Just strip...insert...crimp; caps hold cable ends in place for simple two-hand installation.

SAFE: fully insulated to protect personnel; protected against water and weather; neat, attractive appearance.

Get the full story on **INSULINK** pre-insulated connectors from

BURNDY

59-6

Norwalk, Connecticut — In Europe: Antwerp, Belgium — Toronto, Canada

LIGHT AND POWER LINES

A Reverse Twist On The Phobia That Russia Is Out-cing Us—We have needed an effective antidote for vehement pronouncements that America is now or l soon become second rate. Thanks to Bryce N. rlow, deputy assistant to President Eisenhower, we v have one.

Speaking at the recent Southwest Electric Conference Chandler, Arizona, Mr. Harlow outlined in dramatic hion the contortions America would have to go ough were it to exchange places with the Soviets. In order to enjoy the glories of the present Soviet tem, he said we would have to abandon three-fifths our steel capacity, two-thirds of our petroleum ca-city, 95% of our electric motor output, destroy two every three of our hydro-electric plants, and get along a tenth of our present volume of natural gas. We uld have to rip up 14 of every 15 miles of our paved ghways and two of every three miles of our mainline lway tracks. We'd sink eight of every nine ocean-ing ships, scrap 19 of every 20 cars and trucks, and rink our civilian air fleet to a shadow of its present e. We would cut our living standard by three-fourths, stroy 40 million TV sets, nine of every ten telephones, d seven of every ten houses; and then we would have put about 60,000,000 of our people back on the farm. And, Mr. Harlow continued, we would then, really revel in the Soviet scheme of things, have to assume ew military problems. We'd have to accept a heavy bomber gap, a medium bomber gap, a nuclear submarine gap, a missile submarine gap, an aircraft carrier gap, an overseas bases gap, an allies gap, and a strategic and tactical gap. We'd see hostile troops maneuvering in Canada and Mexico, hostile air bases humming in Canada, Mexico and Puerto Rico, hostile missiles poised in Canada and Mexico, hostile submarines menacingly gliding off New York and Los Angeles, hostile aircraft carriers prowling the Caribbeans—all armed with nuclear explosives of paralyzing power; and we'd have an added discomfort—we'd know that the folks in Florida, Texas and California sullenly wished the rest of us were dead and could hardly wait to prove it. In trying to patch this up, we would have to struggle with a hundred or so different languages, wondering all the while how many of our soldiers would have to garrison the homeland if a serious world crisis arose, and how many of our troops would really perform.

In answer to the claims that the Russians are leap-frogging us in electric power facilities, Mr. Harlow declared that if they are to catch up with us by 1980, they must, in the next 20 years, build the equivalent of a brand new Hoover Dam every 21 days. They will have the formidable task of adding 390 million kilowatts by 1980 just to break even with America.

This compelling message merits frequent repetition in combatting those who are all too prone to disparage our country's strength.

Publisher and Editor

Haywood Publications

HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

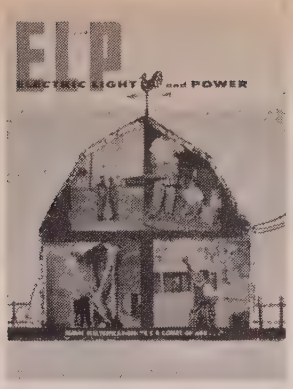
ELP and ELECTRIC LIGH

Vol. 38 Contents for May 15, 1960 No. 1

MANAGEMENT / MARKETING

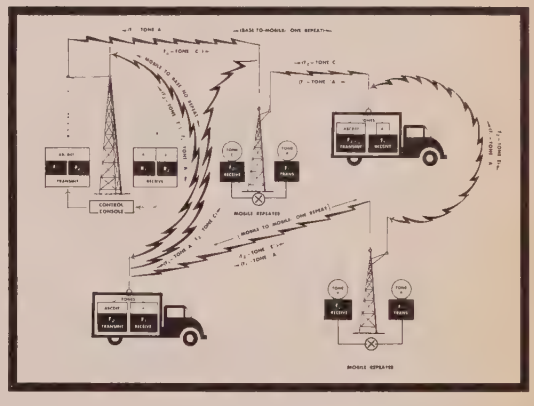
ENGINEERING / OPERATION

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—$10.00 per year; other domestic subscribers—$2.00 per single copy or $15.00 per year; Canadian and foreign subscribers—$1.50 per single copy or $20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

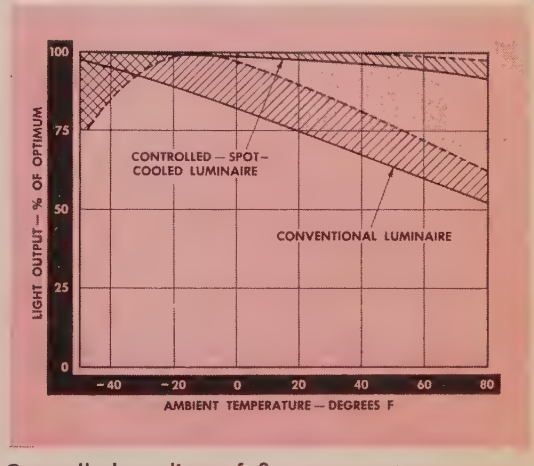


COVER NOTE

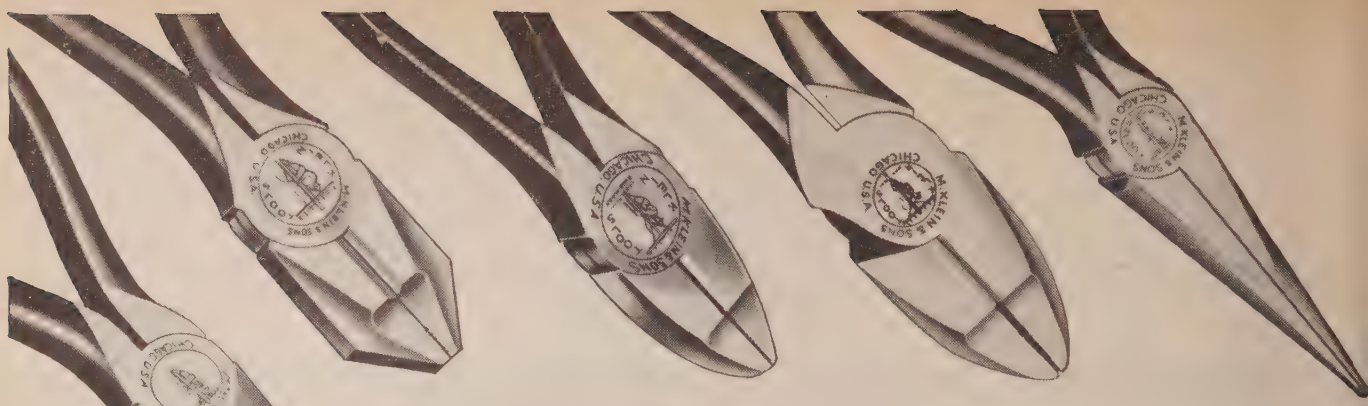
EL&P, on the 25th Anniversary of REA, salutes those who have virtually completed the electrification of America's rural areas. Design by Joe Schiavo, EL&P art director.



Advanced technology, plus FCC rule changes make possible expanded mobile radio operation.



Controlled cooling of fluorescent street lighting luminaires improves output, cuts overall costs.



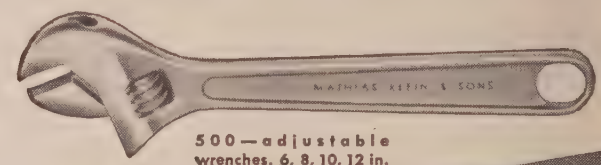
201—famous Klein Side Cutting Plier. Sizes 5, 6, 7, 8 and 9 in.

201-NE—rounded nose side cutting plier. Sizes 5, 6, 7, 8 and 9 in.

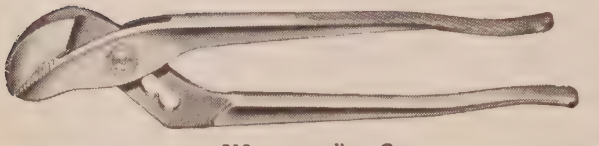
213-9NE—high leverage plier. Will cut regular and weatherproof hard drawn copper wire up to No. 2.

301—long nose plier. Available in 5-, 6- and 7-in. sizes. Also may be had with cutters.

202—narrow nose oblique cutting plier. Available in 5- and 6-in. sizes.



500—adjustable wrenches. 6, 8, 10, 12 in.

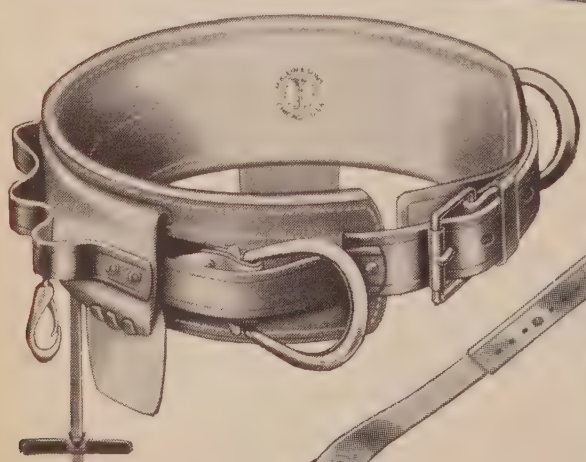


510—pump plier. One hand operation. Length, 9½ in.

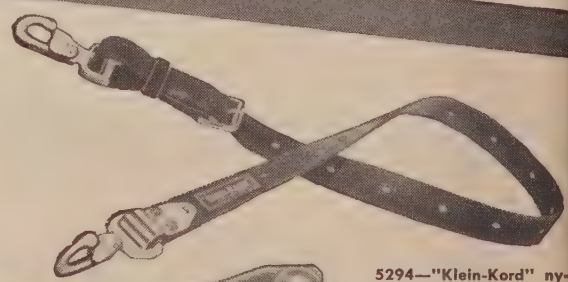
KLEIN TOOLS
EST. 1857 TRADE MARK REG.

over a century of progress

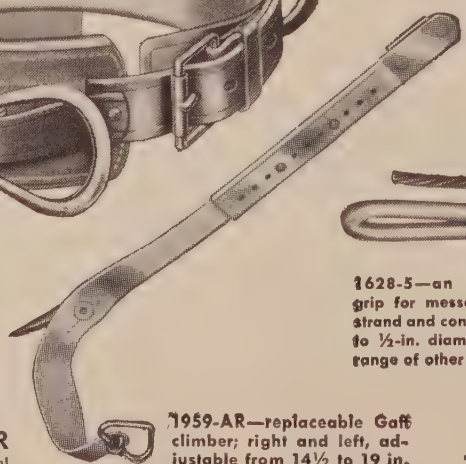
Klein has been the leading supplier of tools and equipment to the electrical industry since the first wires were strung. It was over 100 years ago that Mathias Klein first opened his little forge shop in Chicago. Today the name Klein is known for quality the world over. From your Electrical Distributor, you can secure anything you need in tools and equipment for linemen and electricians. Below are a few of the popular Klein items available.



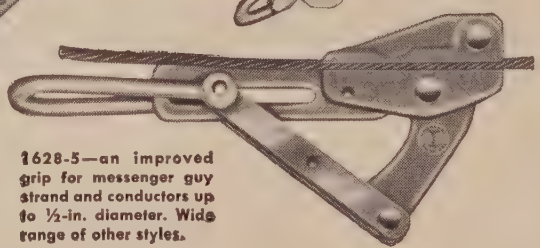
5249—linemen's belt. Full floating with "Klein-Kord" sliding trace. One of a complete line.



5294—"Klein-Kord" nylon safety strap made of multiple plies of strong, woven nylon bonded with frictioning and vulcanized in neoprene.



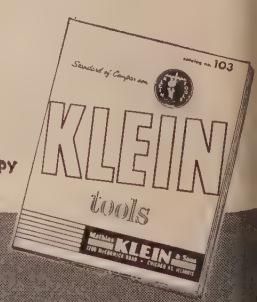
1959-AR—replaceable Gaff climber; right and left, adjustable from 14½ to 19 in. Other designs available.



1628-5—an improved grip for messenger guy strand and conductors up to ½-in. diameter. Wide range of other styles.

ASK YOUR SUPPLIER
Foreign Distributor: International Standard Electric Corp., New York

This new Klein Catalog is just off the press. A copy will be sent to anyone interested on request.



Mathias KLEIN & Sons
Established 1857 — Chicago, Ill., U.S.A.
7200 McCORMICK ROAD • CHICAGO 45, ILLINOIS

LIGHT AND POWER LINES

Coming Up: The International Conference On Large ectric High-Tension Systems – In common with ›wer-systems engineers throughout the world, our dustry's engineers have an important stake in CIGRE's th biennial meeting coming up in Paris June 15-25. sizable delegation of U. S. representatives will be in tendance and eight U. S. papers are to be presented r discussion.

A group of 19 leading U. S. authorities in power sys-m engineering guide and direct our participation in is oldest and largest of international organizations for terchange of engineering information among nations. was founded in March 1921 to study advances in the gineering of large high-voltage electric systems, and w has over 2400 members from 50 countries; 314 from e U. S.

During the past decade, American interest in foreign wer-system developments has grown tremendously. his has manifested itself in increased foreign travel by r engineers, increased participation in international eetings, and intense interest in technical articles pub-hed in the U. S. dealing with important power-system velopments in foreign lands.

As a further contribution in this field, EL&P is send-g a staff editor to the CIGRE meeting, and throughout rope, to arrange for preparation of feature technical ticles to be by-lined by recognized European authori-s in the electric power field, and for publication in L&P in coming months.

'Take Another Look," and Circumvent Accidents – his admonition sets the stage for Commonwealth Edi-n's newly completed "home-style" movie, a strikingly ective picturization of the penalties for **not** taking other look.

Simulated reenactment of some of the all-too-preva-nt types of serious and semi-serious accidents is given dramatic touch of reality by utilizing the company's vn personnel throughout the movie. Thus the under-lying idea that "it could happen to you" is given double emphasis.

To illustrate one of the techniques used in safely simulating serious accidents, arc-welding flashes were superimposed on substation and overhead-line scenes to depict electrical flashes resulting from bodily contact with live parts. In one scene showing a worker stepping off into a momentarily unguarded opening in the floor grating of a generating station, the worker landed safely (out of camera range) in a borrowed fire-department net held by his co-workers. Of course he appeared badly injured when seen stretched out on the floor below.

Over a period of time, this unusual film will be seen by every employee of the Edison Company. It will also be used in safety training work.

The company's safety department wrote the script and directed the action. The film was professionally edited and hired equipment was utilized for the sound recording portion of the work.

Net cost to the company was only a small fraction of that of a similar commercially-produced film, not including working time of the company employees who participated. Although not available for loan to other utilities, copies of the film can be purchased from the company at $150 each. Running time is about 26 minutes.

In the never-ending war on accidents*, this film can be a potent weapon. Moreover, the personalized approach in a safety film is one to be recommended for general adoption by all utilities.

Publisher and Editor

*See page 3 of the April 15, 1960, issue of EL&P for a companion editorial titled "There Can Be No Neutrals In The War On Accidents."

HAYWOOD PUBLISHING COMPANY
PUBLISHERS OF:
- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

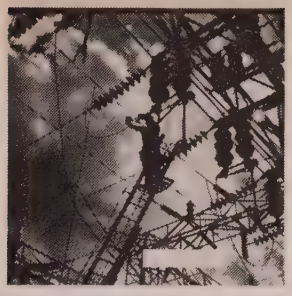
ELP and ELECTRIC LIGH

Vol. 38 Contents for June 1, 1960 No. 11

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—$10.00 per year; other domestic subscribers—75c per single copy or $15.00 per year; Canadian and foreign subscribers—$1.50 per single copy or $20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

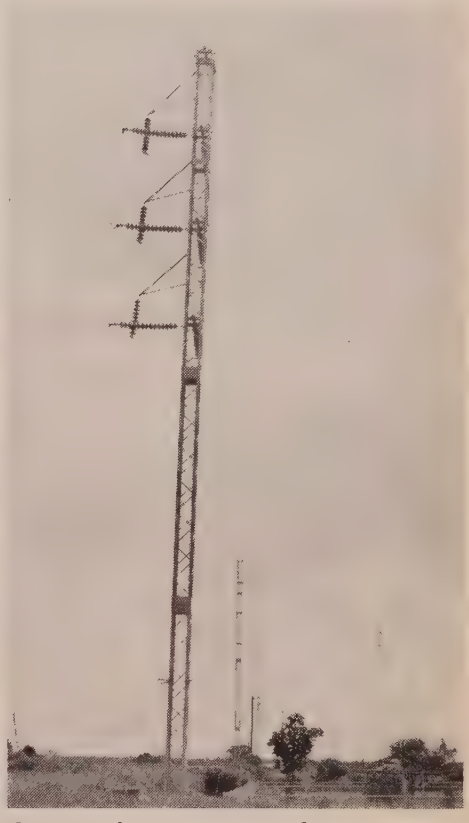
ELP
ELECTRIC LIGHT and POWER

POWER



OUR COVER

Lineman makes final connection of 138-kv line to high voltage substation in Northern Indiana. Photo courtesy of Northern Indiana Public Service Company.



Getting the most out of expensive rights of way involves considerations of costs, careful planning, and structure designs acceptable to adjacent property owners.

Inherent advantages of electric commercial cooking prevail over competitive fuels despite higher first costs and operating costs of equipment.

21 Years Underground

—and still as good as new!

21 years ago, the **Niagara Mohawk Power Company** specified Burndy MOLEs for their underground modernization program. Specifications called for a connector that would perform without fault, under prolonged exposure to dampness, oils, extreme temperatures, and last the life of the cables connected. The MOLEs met all specifications, and are as good as new today ... proof beyond doubt that Burndy MOLEs have the high quality necessary for underground systems.

Utilities thruout the country have had similar long years of trouble-free experience with the MOLE ... experience that proves that the MOLE meets underground specifications for maximum dependability.

If you are considering "going underground", or expanding your present system don't take a chance on costly burnouts and disrupted service, call your local Burndy representative ... he has had years of underground experience and can help you get maximum dependability and flexibility in your underground system.

Photo from Niagara Mohawk Power's file, dated 1938, showing actual installation of MOLE in its underground system. These same MOLEs are in operation today, after 21 years of trouble-free performance.

BURNDY 59-19

ELECTRICAL CONNECTORS

Norwalk, Connect. In Europe: Antwerp, Belgium Toronto, Canada

LIGHT AND POWER LINES

EEI's Long Look Ahead Envisages Tremendous Growth In Power Needs — In view of this year's relative "lull" in generation additions to our nation's utility systems, can it be possible that we must add an average of 18 million kw of new capacity annually for the next 20 years to achieve the 1980 total EEI now says will be required to meet our power needs at that time?

Fantastic as this prospect may appear, it has sound backing, for the results of two quite different study approaches tallied very closely. One was based on estimated loads and kwh requirements by FPC power-supply regions, and was made by a task force of utility men with years of experience in assessing power needs and supplies. The other was an EEI staff projection based on correlation studies of kwh sales and components of Gross National Product.

Based on EEI's forecast of regional generation additions for the 1960-80 period, the rate of load growth in Region Five will be greater than that of any other region in the country. This area embraces Texas, Oklahoma, Louisiana, Arkansas, Kansas, most of New Mexico, and parts of Missouri and Mississippi. Percentagewise, this region shows a steady climb from 9% of the total generation added in 1957, to 14% in 1958, 16% in 1959, and 20.8% in the 1960-80 period.

Close behind Region 5's 75.9 million kw addition forecasted for the 1960-80 period come Region 2 with 67.1 million kw, Region 3 with 66.3 million kw, and Region 1 with 64.5 million kw. Next comes Region 4 with 41 million kw, while the Pacific and Intermountain areas combined (Regions 6-7-8) show 1960-80 additions totalling 50.5 million kw.

Further analysis of the EEI figures reveals a surprising trend in the relationship of the total generation additions in Regions 6, 7 and 8 to the additions for the entire country. Percentagewise, this combined area has shown a steady decrease from 23% of the national total in 1957 to 22% in 1958; to 15% in 1959; and to 13.8% for the 1960-80 period. This detracts in no way from the spectacular growth in Regions 7 and 8, in particular, but attests to the tremendous magnitude of steady growth elsewhere in our country.

In making its study, EEI also took one long look beyond the 1960-80 period . . . to the year 2000. Assuming the over-all growth continues at about the same rate it has since the end of World War II, total power output by the year 2000 will probably be in the range of six to ten trillion kwh!

Of course there will be no shortage of problems which our industry must overcome in carrying out the vast expansion program envisaged by EEI, but, as EEI President Allen King says in his message of welcome to the Annual Convention, "Without problems, there would be no solutions—and no progress. A problem is frequently an opportunity, because once it is surmounted, new vistas for growth and service are opened."

Publisher and Editor

HAYWOOD PUBLISHING COMPANY
PUBLISHERS OF:
- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP and ELECTRIC LIGHT

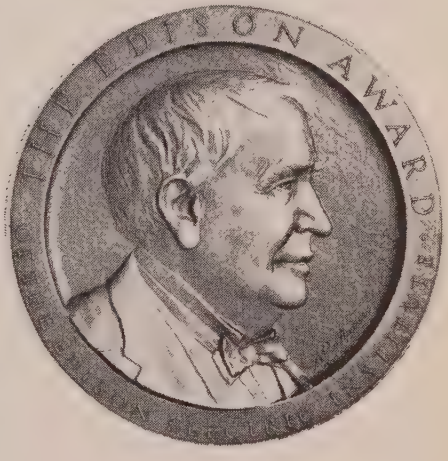
Vol. 38 Contents for June 15, 1960 No. 12

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—$10.00 per year; other domestic subscribers—75c per single copy or $15.00 per year; Canadian and foreign subscribers—$1.50 per single copy or $20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

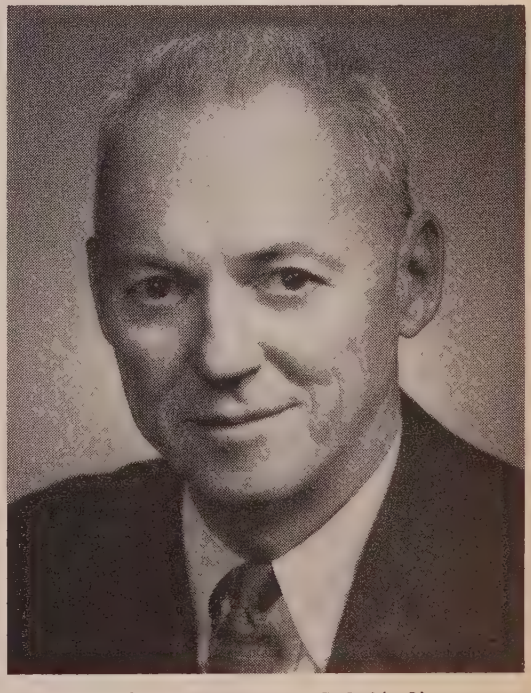
ELECTRIC LIGHT and POWER

COVER NOTE

This painting, by Rosenfeld, was prepared for an American Electric Power information booklet. It was used by Indiana & Michigan Electric in mural size as central point in the recent Great Lakes "Business Opportunities" area development industrial exhibit. The exhibit won First Award in PUAA's Better Copy Contest.



For news of the Edison Award Competition, see page 79



EEI elects Connecticut P & L's Sherman Knapp president for 1960

easy to string

REYNOLDS 5005

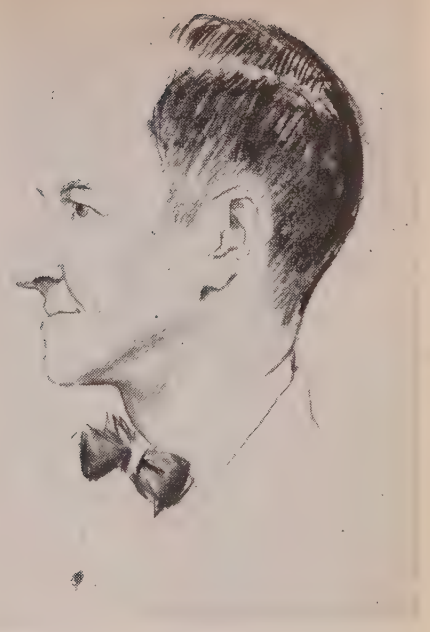
high strength, all-aluminum conductor

This all-aluminum conductor is easier to string, easier to handle from storage to installation because it's light in weight—has no steel core. It is also easier to splice and eliminates chance of galvanic corrosion. 5005 aluminum alloy resists rough treatment and abrasion. Economical, too—costs less than any other conductor with comparable properties. Minimum guaranteed conductivity 53.5%. Complete data available from your nearest Reynolds branch office, Reynolds Electrical Distributor, or *Reynolds Metals Company, P. O. Box 2346-EJ, Richmond 18, Virginia.*

REYNOLDS ALUMINUM

Watch Reynolds TV shows: "BOURBON STREET BEAT" and "ADVENTURES IN PARADISE"; and "ALL STAR GOLF" (resuming in October)—ABC-TV

LIGHT and POWER lines



Security Analysts View Articles In Trade Press As Measure Of Utility's Progressiveness — It may come as a surprise to many electric-utility people to learn that security analysts pay close attention to feature articles published in power-industry magazines such as EL&P. And why do they? Simply because they are convinced that if an electric utility is truly progressive it will be evidenced by the regular appearance of by-lined articles in the industry's trade press relating its more important contributions to advancement of the industry.

Utility top management can readily correct any deficiencies in this area of their operations by offering every encouragement to their key people to prepare such articles for the trade press.

One large power company places such a high value on this activity that it assigns a regular work order to preparation of each by-lined feature article, allots company time for the task, and sets a target date for its completion.

This is in vivid contrast to the utility attitude occasionally encountered that its people have no time to give to writing articles for trade magazines. Realization of the importance that security analysts attach to by-lined articles in the trade press should help to place this important activity in proper perspective.

Published Information Permits Fast Go-Ahead On Major Project — One of the technical papers prepared for this year's CIGRE meeting in Paris brought out a point that is of extreme importance to power-system designers throughout the world.

This paper concerned the design and construction of the first 330-kv transmission system in Australia. In it the author stated that as EHV transmission is becoming more common, many of the design problems which previously required costly and time-consuming research can be solved by drawing on a large pool of accumulated knowledge.

As there was little time available for research in this instance, the design of the system was based substantially on published information, this author reported.

Benefits from published data can be far reaching, as this experience demonstrates—and our own industry's magazines render an important service in helping to disseminate the findings from important research and development efforts.

Team Approach Can Minimize Computer Problem-Solving Time — Extremely rapid growth in our industry's adoption of computer techniques for solution of engineering-design problems has created a further problem peculiar to this important new field of endeavor—how to coordinate most effectively the work of the designer and the programmer.

It is becoming increasingly important that our engineers be able to formulate problems in the most suitable way for computer solution. Then the programmer, whose work is to plan the calculating schedule and who is familiar with the short cuts and the discriminating powers of the machine, can provide the engineer with a full set of results with minimum consumption of computer time.

Computers are so fantastically fast in making calculations that the need for saving precious seconds and minutes tends to become obscured. On the other hand, those who are working in this field are well aware of the high value of computer time.

Clearly this situation calls for special training for engineers engaged in design work requiring computer calculations. Likewise it places a premium on those who can so program the designer's problems as to maximize the efficiency of expensive computer facilities.

Teamed together, such capabilities can do wonders.

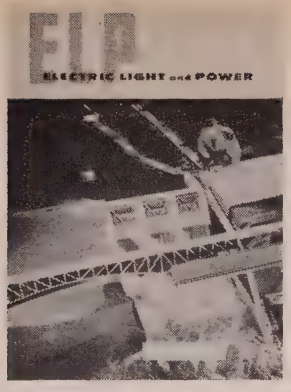
Publisher and Editor

HAYWOOD PUBLISHING COMPANY
PUBLISHERS OF:
- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP and ELECTRIC LIGHT

Vol. 38 Contents for July 1, 1960 No. 13

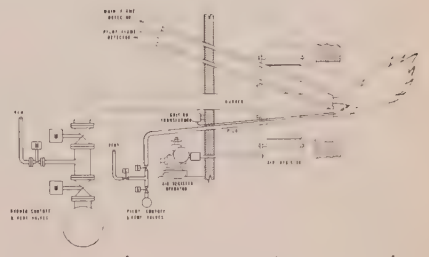
ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—$10.00 per year; other domestic subscribers—75c per single copy or $15.00 per year; Canadian and foreign subscribers—$1.50 per single copy or $20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.



OUR COVER

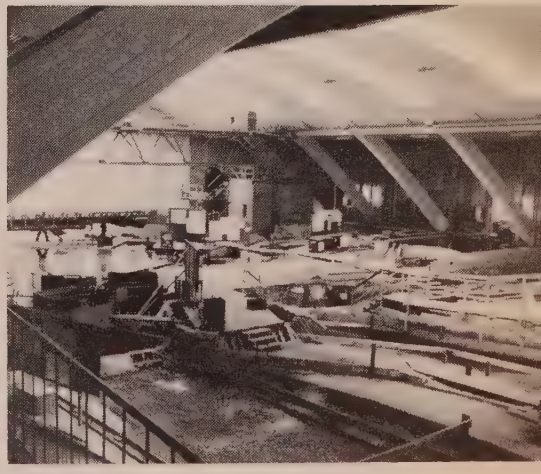
By simulating actual operating conditions of hydro-electric plants with scale models before actual construction, Swedish engineers are able to make alterations which would otherwise be very costly either through later changes or lost efficiencies.

POWER



As more and more operations are taken out of the operator's hands and made automatic, it places a higher degree of reliance on quality components and continuous self-checking circuitry.

ANUFACTURERS / PRODUCTS

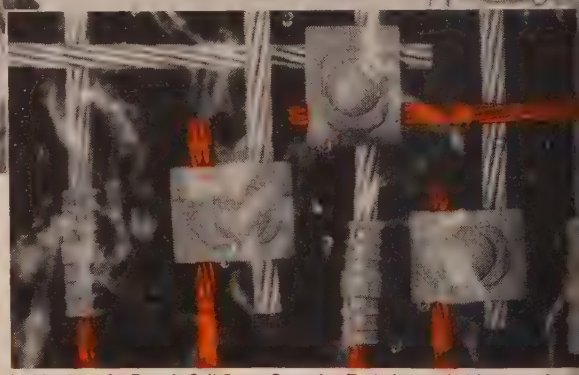


Interior view of the Hydraulic Laboratory of Sweden's State Power Board where tests show most economical solutions in new hydro-electric station design.

in the field

The Aransas Pass Test Line of Central Power & Light Co. consists of 200 foot test spans from which new tap connections are made periodically on weathered run conductor and current cycled.

...and in the lab



Inside view of a Burndy Salt Spray Corrosion Test shows what happens to co and cables of dissimilar metals when exposed to severe atmospheric con

BURNDY RESEARCH

CONCENTRATES ON THE DEVELOPMENT OF BETTER ELECTRICAL CONNECTIONS

Burndy's field research with Central Power & Light on weathered overhead lines is expected to provide valuable information on connector installation practices, and possible data for the future design of connectors and cables with longer and more predictable life spans.

Burndy's research has produced: Massive Aluminum Tap—TAPIT®; Single Sleeve ACSR Splice—UNISPLICE™; Pre-insulated Service Entrance Splice—INSULINK®. Burndy research will continue to concentrate on the development of better electrical connections.

BURNDY

58-18

NORWALK, CONNECT. • BICC—BURNDY Ltd., Lancs., England • In Continental Europe: Antwerp, Belgium • TORONTO, CANADA

LIGHT and POWER lines

Radically New Departures In Energy Conversion Should Spur Student Interest In Power Field—Lack of challenge in the staid old 60-cycle power field has been held responsible for driving the majority of the more recent engineering graduates into electronic enterprises. Now that news of exploratory work in the new fields of energy conversion is crowding into the headlines, perhaps more of our engineering students will decide that exciting new challenges are still to be found in the 60-cycle power field after all.

These new technologies are destined to have a strong impact on electrical engineering educators, engineers in training, and engineers already in practice. Dealing with the motion of charges in gases, in semi-conductor solids, or in liquids, these new fields will require a better understanding of the elementary particle, in order to understand the behavior of the system or component, than ever before in electrical engineering.

Surely the new crop of engineering students will sense more real challenge in such a term as magnetohydrodynamics than in just plain old electronics!

Standardization Must Not Be Allowed To Hamper Technological Progress—When electrical-equipment design has advanced to the stage where physical components are essentially comparable, then standardization benefits everyone. But when a new scientific discovery permits a completely different design approach—and one offering greatly improved performance characteristics—then an attempt to conform to a standardized physical makeup can prevent the designer from making most effective use of new ideas and new concepts.

Occasionally a "break-through" in design dictates a radical departure from the physical makeup of a previous design. In such a case, adherence to certain standardized features can prove a stumbling block to important progress.

Equipment manufacturers make great efforts to help establish standards and to conform to them. However, their electric-utility customers may unwittingly do a disservice to themselves if they hamstring equipment designers by insisting upon adherence to standards that are not compatible with highly beneficial departures from existing design practices.

Supersonic Reddy—There's an interesting tale to tell about that B-58 Hustler used for testing purposes at Convair's Fort Worth plant, where this twice-the-speed-of-sound plane is manufactured. Formerly known only as B-58 No. 25, it now has assumed its official identity as Reddy Kilowatt.

According to *TESCO Roundup*, Texas Electric Service Company's employee publication, it all began when this company received a call from the project engineers assigned to this particular airplane. They explained that their project consisted of testing electronic systems for compatibility and operation, and asked permission to name the aircraft Reddy Kilowatt as being symbolic of the electrical devices it carries. TESCO was able to cooperate with Convair by letting the Reddy Kilowatt trademark appear on the "Hustler."

The appropriateness of this name for the B-58 Hustler becomes more evident when it is considered that on an average demonstration flight this plane uses enough electrical power to supply an average home for an entire month.

Painted on either side of the B-58's fuselage, the familiar Reddy carries the initials TESCO identifying him as the trademark of Texas Electric Service Company.

Flying high and fast all over the nation, Reddy also symbolizes the limitless possibilities of this electric light and power industry of ours.

John Garrett

Publisher and Editor

a Haywood publication

HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

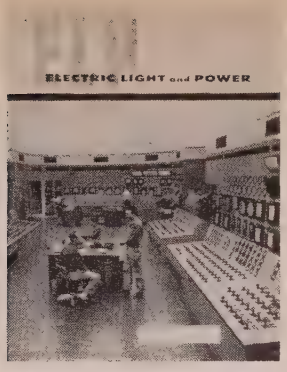
- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP and ELECTRIC LIGH

Vol. 38 Contents for July 15, 1960 No. 14

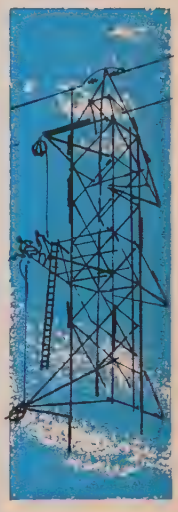
ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—$10.00 per year; other domestic subscribers—75c per single copy or $15.00 per year; Canadian and foreign subscribers—$1.50 per single copy or $20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

d POWER

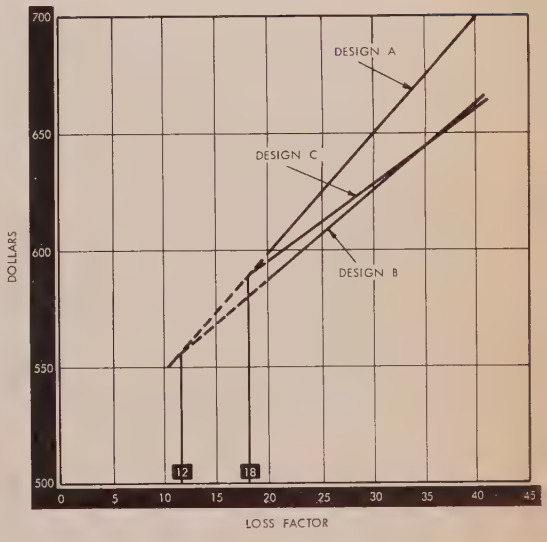


OUR COVER

Huge control room of Northern Indiana Public Service's Dean H. Mitchell Generating Station in Buffington Harbor, Gary, Indiana allows NIPSCO employees to appraise by closed circuit TV the flame in the three seven-story boilers and various remote gauges. Station is now complete. Photo courtesy NIPSCO Picture.



This Idaho Power Company 230-kv line, besides transferring bulk power over a considerable distance, serves ranches and a rural community along a 25-mile r/w via shield wire energized to 40 kv.



Effect on present worth of total annual costs for varying loss factors in distribution transformers serving the same power factor load.

GUIDED, POWER-FED AUGER GUARANTEES STRAIGHT HOLES

takes only two controls to put it through its paces

Simplicity of operation is the big difference between the Series EM-2 "Earth-Master" and ordinary hydraulic diggers which require movement of three or four levers to dig a hole of comparable size. Unlike diggers that depend on the derrick for down pressure, the frame-guided EM-2 provides direct digger control — with full power down feed exerting several thousand pounds of pressure. Auger can be reversed, run at low speed for digging or at high speed for spin-off. Installed on a live-boom derrick like the Series PM-20 "Pole-Master" shown, this portable unit provides the power and operating features of a fixed-position digger.

Digger and derrick are hydraulically powered . . . controlled independently to permit digging while pole is suspended, an especially valuable feature where cave-in is possible. Pole can be set just as soon as the hole is dug.

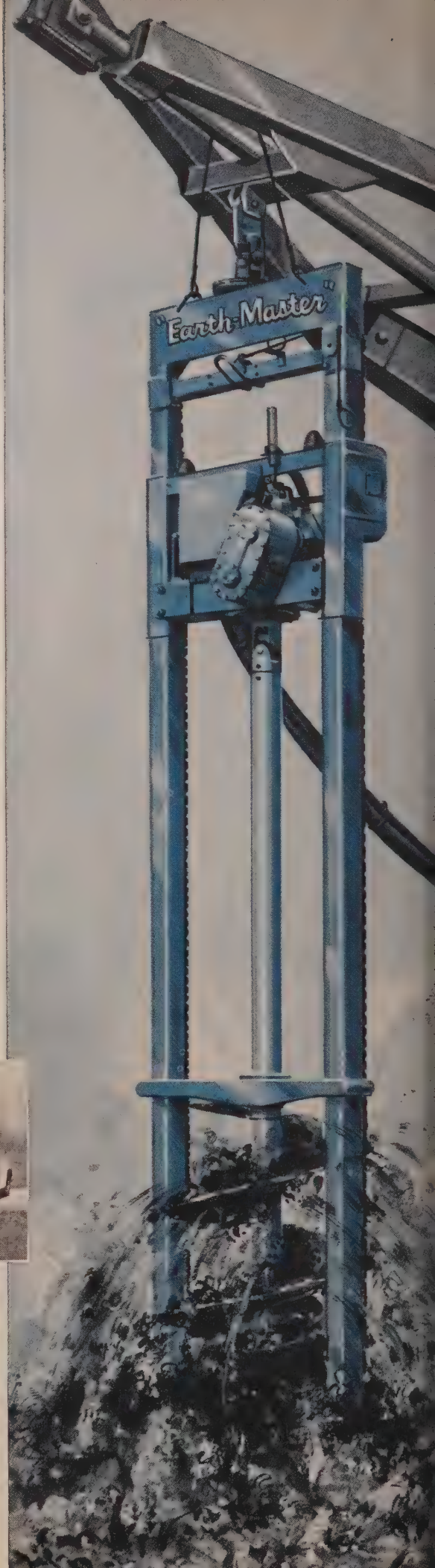
Twin-column telescopic frame, which stows out of the way when derrick is needed for normal hoisting, also serves as a ground prop for pole-pulling and for increased derrick capacity.

SERIES EM-2 "Earth-Master" Hydraulic Hole Digger
DIGS VERTICALLY OR AT ANGLES . . . FROM 9" TO 30" IN DIAMETER, UP TO 10' 6" IN DEPTH

SERIES DF-1 "*Earth-Master*" Hydraulically-powered . . . digs to 10'6" deep, 9" to 20" in diameter. Shown above on a Series PM-10 "Pole-Master" Derrick.

another reason why
UTILITIES EXPECT MORE FROM

POWERS American



FOR DESCRIPTIVE LITERATURE AND PRICE INFORMATION WRITE . . .

McCABE-POWERS BODY COMPANY

5900 NORTH BROADWAY • ST. LOUIS 15, MISSOURI

625 Cedar Street, BERKELEY 10, CALIF.
1461 E. Washington Blvd., LOS ANGELES 21, CALIF.
5525 S. E. 28th Ave., PORTLAND 2, ORE.

LIGHT and POWER lines

Comfort Often Brings Complaints—About That Ridiculous "Light Bill"—A new air conditioning customer n get mighty "hot under the collar" when he receives s electric service bill following his first month of mfort-cooled, dust-free, humidity-controlled living. Electric utilities which have lived for many years ith the customer bill complaints created by air contioning use have learned how to handle them with minimum of friction. Their experience is becoming increasing value to other utilities as air-conditioned mes spread throughout the nation.

Prospective air conditioning customers need to ow in advance that many physical conditions peliar to their own homes, as well as their own parcular mode of operation of their air conditioning uipment, can materially affect the amount of their w power bill.

Even though his air conditioning equipment is eating his interior weather, the customer frequently unaware of the important influence of the exrior weather conditions on his operating cost. And is a rare customer that fully realizes in advance that ilure to maintain his air conditioning equipment uch as removal of dust accumulation on condenser ils) can run up his bill in alarming fashion.

It is only natural for the customer who feels that e operating cost of his air conditioning equipment exorbitant to compare costs with those of his friends d neighbors. He needs to realize in advance that so any variable factors influence these costs as to renr comparisons unrealistic. Included are such fundaental considerations as the thermostat setting and eration time.

Of course faulty installation can profoundly affect erating costs. Detection of this contributor to high erating cost can also be expensive to the utility that ust come up with the answers to the customer's mplaints.

Because so many factors enter into the operating st for air conditioning, each complainant's situation requires separate study and explanation. Perhaps some of this could be alleviated by a continuous program of pre-education directed at prospective converts to the blessings of air-conditioned living.

Make It Easy To Boost Lighting Levels When Needed—Even those who don't think they need high-level illumination in stores and offices today are most likely to find it a necessity later on. So why not be prepared to do it the easy way by designing the initial lighting installation so that more lamps and fittings can easily be added whenever required?

It seems likely that such provision for the future would not unduly burden the system to be installed to care for present needs.

The ability to go to higher lighting levels without a major upheaval, and at a more reasonable cost, should result in much earlier action to accomplish needed boosts in lighting levels than would otherwise be the case. Those who occupy the better-lighted quarters would benefit in large measure, and the utility would acquire highly desirable new load.

A Special Service That Brings Its Own Rewards—This year marks EL&P's 31st year of annual detailed reporting of industry performance in sales of major electric appliances during the preceding year, plus promotion plans of the electric utilities for the current year.

This annual report is a service EL&P is happy to perform for the industry. It could not be accomplished, however, without the continued co-operation of the utility commercial executives who contribute the data that makes this report possible.

John Garrett

Publisher and Editor

HAYWOOD PUBLISHING COMPANY
PUBLISHERS OF:
- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

EL and P ELECTRIC LIGHT

Vol. 38 Contents for August 1, 1960 No. 15

MANAGEMENT / MARKETING

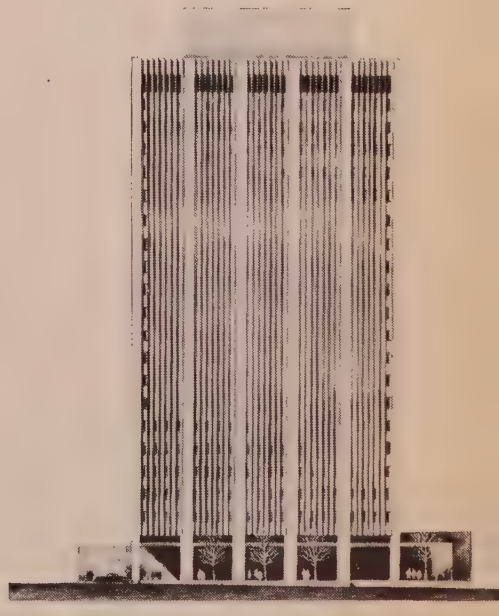
ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—$10.00 per year; other domestic subscribers—75c per single copy or $15.00 per year; Canadian and foreign subscribers—$1.50 per single copy or $20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

ELECTRIC LIGHT and POWER

OUR COVER

Modern fluorescent street lighting helps provide safety through good visibility along $12-million Vine Street extension of the Schuylkill Expressway through downtown Philadelphia. Main underpasses have between 50 and 60 fc of illumination during daylight hours for minimum eye adjustment. *Photo courtesy of General Electric Company.*

Private street lighting benefits utility and customer alike.



Office building's climate blends heat from lighting with air conditioning.

LOW COST

REYNOLDS 5005

high strength, all-aluminum conductor

Reynolds 5005 costs less than any other conductor with comparable properties. You get lower power losses . . . improved voltage regulation . . . increased current carrying capacity. Minimum guaranteed conductivity 53.5%. And 5005 is also light in weight—stringing and handling costs are lower. It has no steel core, thus is easy to splice and there is no chance of galvanic corrosion. Complete data available from your nearest Reynolds branch office, Reynolds Electrical Distributor, or *Reynolds Metals Company, P. O. Box 2346-EJ, Richmond 18, Virginia.*

Watch Reynolds TV Shows: "Bourbon Street Beat" and "Adventures in Paradise"; and, resuming in October, "All Star Golf"—ABC-TV

LIGHT and POWER lines

American Engineers Can Be A Potent Force In ternational Affairs—With so many of our American gineers now returning from Europe following at- ndance at the CIGRE biennial meeting and the orld Power Conference, this seems a good time to call some of Walker Cisler's views on the role of e American engineer in international affairs.

Speaking at an ASME luncheon, he proposed ur- ntly that we make it possible for more American en- neers to give some of their time and energy to the oblems of the lesser developed nations and also to sist in the development of mutual goals in technical atters among nations that share our opportunities r leadership in the application of technology to the sic causes of human want, insecurity, and unrest ound the world.

In answer to the question as to how the American gineer can find time to lend assistance in other parts the world, Mr. Cisler observed that the problem is mplicated by the fact that the more experienced he the more his responsibilities may keep him occu- ed at home. However, he said, with the use of mod- n transportation and communication, an engineer ho is accustomed to working long and uncertain urs can accomplish a great deal in another part of e world and return to his regular duties in less time an he would devote to a routine vacation.

Mr. Cisler also expressed the belief that, from the int of view of the employer, the time is well spent cause of the need for such international endeavors, well as for the experience that he brings back with n.

It is Mr. Cisler's view that a well-balanced company is naturally constituted in such a way that men of wide experience and important responsibility can and should be available to others who need their counsel, whether in the United States or elsewhere, for constructive purposes.

Mr. Cisler's long and distinguished participation in international engineering endeavors gives these views the great weight of deep personal conviction based on experience. No one can appreciate better than he the fact that the over-all economic and technological affairs of mankind are seriously out of balance. Or that these imbalances have resulted in tremendous and danger- ous pressures that show themselves in national unrest and disturb the social, political, and economic rela- tionships of all nations.

There are heartening signs, Mr. Cisler says, that engineers are turning their thoughts toward interna- tional endeavors. Certainly those of our American en- gineers who have been privileged to attend the inter- national technical conferences have had their thoughts so oriented—and as time goes on their numbers are destined to become legion.

Working with materials, people, and money, and utilizing the essential language of the engineer that is the same the world over, our American engineers can do more to relieve the world's serious imbalances than governments and diplomats working without their aid can possibly accomplish.

Publisher and Editor

Haywood Publication

HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

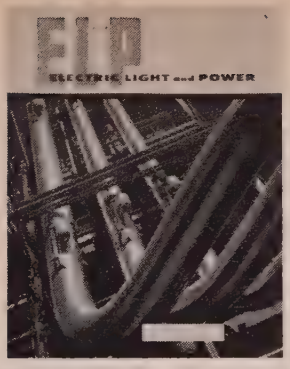
- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP and ELECTRIC LIGH

Vol. 38 Contents for August 15, 1960 No. 16

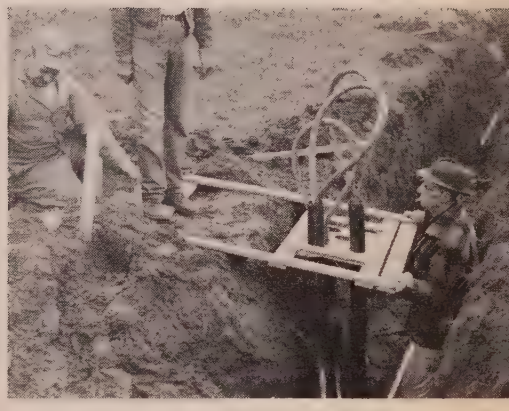
ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—$10.00 per year; other domestic subscribers—75c per single copy or $15.00 per year; Canadian and foreign subscribers—$1.50 per single copy or $20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

POWER



OUR COVER

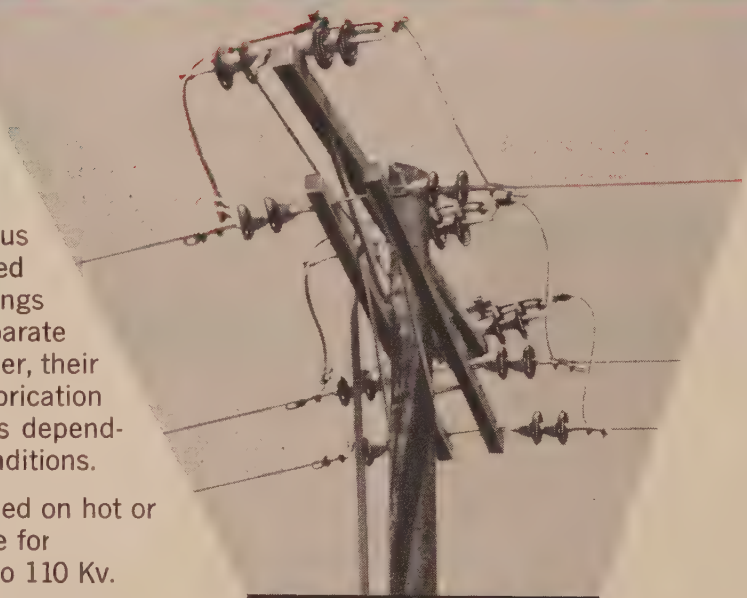
Artistic pattern formed by aluminum-lagged main steam, hot reheat and cold reheat lines connecting steam generator and turbine generator at Arizona Public Service Company's outdoor-type Ocotillo Station, Unit II. Hangers supporting piping allow for its movement with temperature changes.



Portland General Electric can now provide economical underground service for homes in almost any price class . . . see page 58.

Detroit Edison's versatile test truck has been saving the company about $5000 per year in cable work . . . see page 55.

INSTALL KPF SWITCHES WITH OR WITHOUT LINE TENSION!



KPF air break switches operate equally well with or without conductor tension—tension is not necessary to their smooth functioning. Thus KPF switches may be installed on angle poles, major crossings or other locations where separate deadends are desired. Further, their simple design eliminates lubrication or maintenance, and insures dependability under all weather conditions.

KPF switches may be installed on hot or dead lines, and are available for common voltages from 7.5 to 110 Kv.

Test KPF switches with an installation on your own system. Inquire now!

KPF ELECTRIC COMPANY

KPF
AIR BREAK SWITCHES
Standard for half a century

P. O. Box 1257L
Stockton, California
HOward 4-8381

LIGHT and POWER lines

Minimizing Alternative Propositions Can Save luable Time And Expense -Major savings in en- neering man-hours and in cost to our industry can effected by keeping to a minimum the number of ernate propositions requested in both the prelim- ry and final stages of bidding on major electrical paratus.

Determination of the most economical over-all de- n for any major new power facility necessarily re- ires consideration of alternative propositions. How- er, there is a growing tendency to request both eliminary and firm bid proposals on a multitude of ssible designs. Since each of the numerous equip- nt suppliers involved must work up a proposal on ch of the many alternatives, the man-hours required aches monumental proportions. And the cost to the dustry mounts in direct proportion.

Utility and consulting organizations responsible for wer-station design will do themselves an important rvice by minimizing the alternative propositions re- ired of the equipment suppliers. Such action would able the electrical-equipment manufacturers to uti- e the valuable engineering man-hours thus saved more creative endeavors that would bring lasting nefits to the entire industry.

mproved Store Lighting Is An Important Sales l But Our Industry Lacks Specific Evidence—In- iry from an agency planning to embark upon a pro- tional campaign for modernization of store lighting mpted a search for specific evidence that would cument its contribution to increased retail sales. It s soon discovered that such evidence is sorely king.

No doubt this is due in large part to the fact that better lighting is usually only one facet of a store-modernization project. This makes it extremely difficult to measure the contribution which improved lighting has made to increased sales following modernization.

On the other hand, there surely are numerous instances where only the store's lighting system has been improved. Such cases could provide valuable data for promotional purposes if special efforts were made to obtain and publicize the "before and after" story, both in data form and pictorially.

It is to be hoped that everyone in our industry will keep this need in mind when future projects develop which involve only improved store lighting. Then if this information is made available to all who work in this field, through publication in our trade press, important benefits will accrue to our electric utilities, as well as to our lamp and fixture manufacturers.

Drat Those Hum-Bugs!—One of Florida's island preachers is reported to have come up with an amusing theory about the appeal that power poles have for oversized pileated woodpeckers.

After long observation, he has concluded that these birds "hear the humming of the wires, think it's bugs in the poles and go after them."

In any case, "hum-bugs" can be a mighty handy name for whatever it is they seek so diligently, and with such destructive consequences.

Publisher and Editor

Haywood Publications

HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

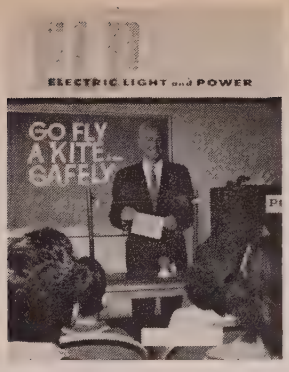
- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP and ELECTRIC LIGH

Vol. 38 Contents for September 1, 1960 No. 17

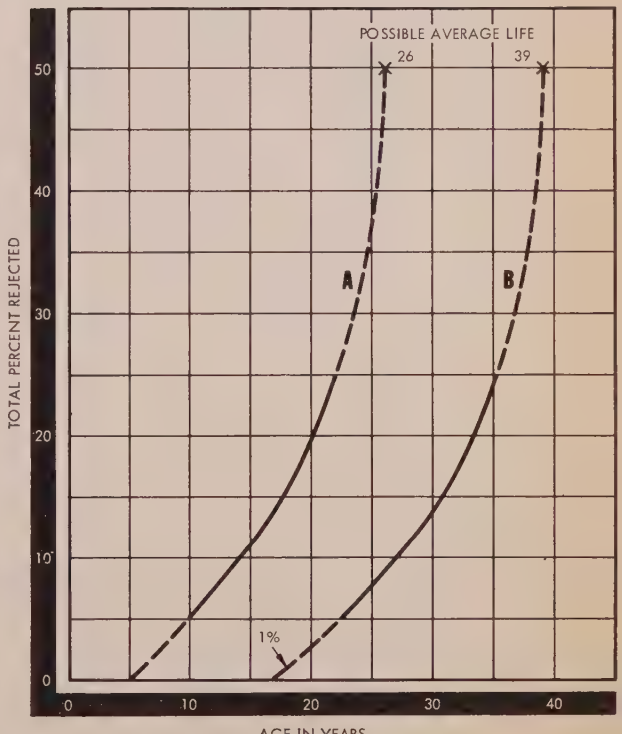
ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—$10.00 per year; other domestic subscribers—75c per single copy or $15.00 per year; Canadian and foreign subscribers—$1.50 per single copy or $20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

POWER



OUR COVER

Lessons in kite flying are taught groups of school children in Pacific Gas & Electric Company territory by means of this demonstration unit. The demonstrator burns up a model kite on a model transmission line, chars a piece of raw meat with electricity, and creates a loud explosion (from a capacitor discharge) when metallic kite string shorts the line.



Ground-line treatment of poles should begin far enough in advance of the one-percent rejection rate to avoid replacements . . . See page 50.

Utility helps transform new desert service area into useful, productive and desirable lands . . . See page 47.

Bethanized Strand protects Niagara Mohawk line

Here is part of a 47-mile transmission line near Buffalo, built recently for Niagara Mohawk Power Corporation. Because the line traverses an industrial area, Bethanized "C" coated strand was selected for overhead ground wires. The ground wire, manufactured to ASTM Specification A-363, is 7/16-in. 7-wire extra-high-strength strand.

With Bethanized strand, you can select from four coating weights to provide adequate protection against corrosion. The coating is applied by Bethlehem's special electrolytic process which makes possible a uniform, tightly bonded zinc coating that is 99.9 pct pure.

The "A" coating weight is intended for service where atmospheric conditions are good. The "B" coating contains twice, and the "C" coating three times, the weight of the "A" coating. The "D" coating, which comes in common, Siemens-Martin and high-strength grades, contains four times the weight of the "A" coating. If you would like to have full details, write to the nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Distributor: Bethlehem Steel Export Corporation

Steel

for strength
. . . economy
. . . versatility

BETHLEHEM STEEL

BETHLEHEM STEEL

LIGHT and POWER lines

Air Pollution Control Progress Lacks Public Appreciation—One of the most disheartening aspects of rk in the field of air pollution control is the seeming k of appreciation on the part of the public of the orts the electric utility industry is making and the gress attained. This is the view which was exssed by George Minasian, Con Edison's Director Community Relations, when he addressed the recent Pollution Control Association annual meeting.

Mr. Minasian also said he is quite convinced that re is only one sure-fire way of getting the story of industry's efforts in this field across to the public, l that is through personal visits to power-generation nts by civic groups, political leaders, educators l even those individuals who take only a personal erest in their local conditions.

n his address, Mr. Minasian also cited a number figures which suggest the possibility of publicizing factual side of the story in a way that would oture public attention.

Examination of the data he presented reveals that the utilities exercised **no** control of flyash there ld be as much as 12 million tons of it dropping on annually (on a national basis)—nearly 33,000 tons day!

t would seem that the public could also appreciate $350-million figure he gave for total expenditures our industry since World War II for air pollution trol.

Possibly in some way the public could also be made understand and appreciate the further point . Minasian stressed that air pollution control repreits an investment on the part of the utility of about for each kw of customer demand. (This is based today's cost of about $5-million for a combined chanical and electrostatic installation for a 360-mw t.)

Our electric utilities have invested so much time, effort and money in control of air pollution that they are fully deserving of public approbation. But it is apparent they will have to blow their own horns long and loud to win the approbation they deserve from the public they serve.

NSP Lights Up Dark Corners With Its New "Nightwatch" Service—For a net cost of only $3.25 per light per month, customers of the Northern States Power Company can now enjoy and profit from illumination of dark spots in residential yards, farm yards and recreational, commercial and industrial areas. This low cost includes installation, maintenance and electricity consumed by the unit.

Under this new service, NSP installs an extra-high-output fluorescent floodlight on any existing Company pole. Farmers may also have the 4-ft-long, 6900-lumen units installed on their own yard poles.

Light from the unit (usually mounted at heights from 20 to 26 feet above ground) can be aimed at a specific area. Photocell control turns it on at dusk and off at daybreak.

NSP "Nightwatch" service provides more security for commercial and industrial customers and home owners against vandalism, pilfering and burglary. It also provides greater safety and improved conditions in areas where work is done after dark.

This appears to be an idea from which everyone gains and no one loses. Thus it should have universal appeal for all electric utilities and their customers.

Publisher and Editor

HAYWOOD PUBLISHING COMPANY
PUBLISHERS OF:
- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

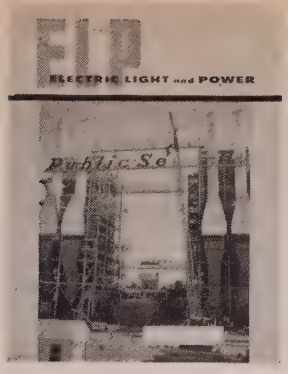
ELP and ELECTRIC LIGHT

Vol. 38 Contents for September 15, 1960 No. 18

MANAGEMENT / MARKETING

ENGINEERING / OPERATION

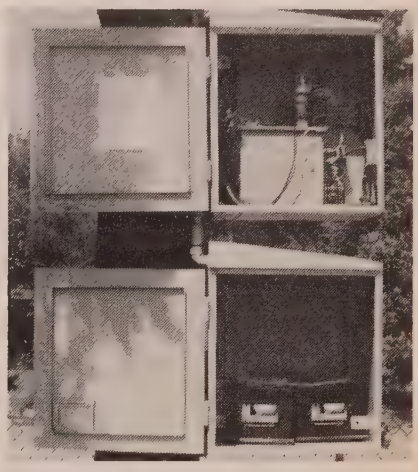
ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—$10.00 per year; other domestic subscribers—75c per single copy or $15.00 per year; Canadian and foreign subscribers—$1.50 per single copy or $20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.



OUR COVER

Letters 8-ft tall, identifying Arizona Public Service Company's Ocotillo Power Plant near Tempe, swing into place between towering boiler structures.

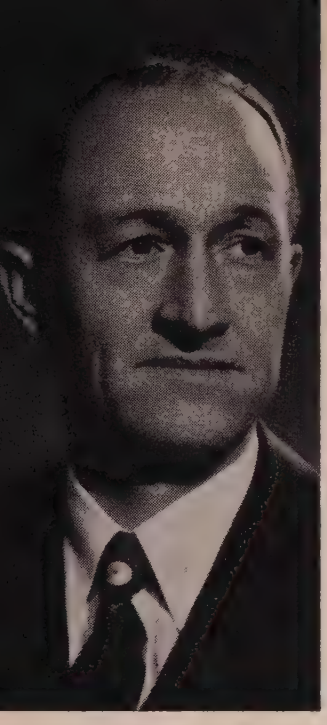
POWER



Mixed opinions from use of remote outage locators . . . see page 68

ANUFACTURERS / PRODUCTS

Commonwealth Edison studies point way to greater substation economies . . . see page 60



LIGHT and POWER lines

Are Our Manufacturers' Profit Margins Approach-g The Vanishing Point? If So, Something's Got To ive!—What is it going to be? A letdown in quality? slowdown in new developments? Or both?

Though this is not a new threat, it is a periodically newed one. And, for some time now, reports reach that the plight of many suppliers is serious enough gain to demand the concern of responsible people in industry which requires a unique measure of de-endability and continuity.

If pencil sharpening in utility purchasing becomes vere enough—and it may be, even now—the con-equences suggested above can and probably will appen. If they do, the ones who will be literally olding the bag are the electric utilities. Unfor-nately, too, the threat is to the **industry,** not just the utilities whose officials take the short-sighted ew, reversing the trend from "Value Analysis" to urchasing on price alone.

First will come a rash of equipment troubles that n have serious repercussions on service to utility stomers. Then—as more time passes—will come ressing need for equipment to meet new system quirements; equipment that will be still only a eam in the eye of the development engineer because ofits were lacking to plow back into research and evelopment.

Manufacturers who have a wide diversity of prod-cts and who supply other industries as well as our vn naturally have a better chance of keeping going ithout a letdown for a considerable period of time; ut what about the more numerous manufacturers ho are not as fortunate and yet are so essential to e continued progress of our industry.

Admittedly there are many facets to this problem nd many areas for argument and disagreement. But ne thing is certain—the quality of today's equipment nd the creation of the equipment our industry must ve to meet future needs must not be allowed to fall prey to the sometimes illusionary attraction of short-term benefits for anyone.

Electric Power's Importance To 20th Century Life—Everyone directly concerned with our electric light and power industry is well aware of the more obvious effects that prolonged power interruptions can have on city life. But are we equally cognizant of many less obvious after-effects?

Some of these have been given dramatic emphasis in a recent issue of "Kaiser Aluminum News" in a feature presentation titled "The City That 'Died' In Its Sleep."

On the supposition that service could **not** be restored following a disastrous power interruption, such rather unanticipated consequences as these are cited:

"Many services would become unobtainable. Prescriptions for eye-glasses could not be ground without power to turn the grinding machines. Shoes could not be repaired for the same reason. Dentists could perform only those operations that require no drilling. Doctors would be reduced to improvising new methods for sterilizing instruments.

"Water would become scarce, once it drained from the mains. There would be no pumps operating to refill them. Without water, plumbing wouldn't work, and it wouldn't matter if it did, since there would be no pumps working to move the sewage from the basins to the sewage-treatment plant. There would be no laundries nor dry-cleaning plants operating to take care of dirty clothes; no water nor power to wash them with at home."

For most citizens, life would be reduced to a level they had never experienced before.

Although we can bolster our spirits with the thought that power supply is almost always restored in very short order now, there remains a very heavy responsibility on our industry. We cannot afford any letup in our striving for even better continuity of service than is provided now.

L. B. Garrett

Publisher and Editor

Haywood Publication

HAYWOOD PUBLISHING COMPANY

PUBLISHERS OF:

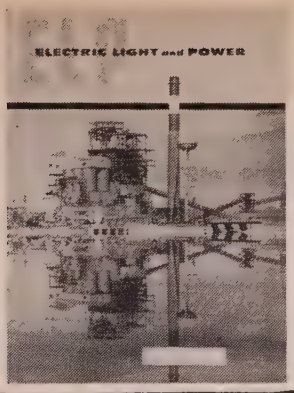
- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP and ELECTRIC LIGHT

Vol. 38 Contents for October 1, 1960 No. 19

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—$10.00 per year; other domestic subscribers—75c per single copy or $15.00 per year; Canadian and foreign subscribers—$1.50 per single copy or $20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

d POWER



OUR COVER

Pacific Power & Light Company's 100,000-kw Dave Johnston steam plant near Glenrock, Wyoming, is duplicated by reflection on cooling water forebay; plant is scheduled to be actually doubled in size by year's end.

Computer cabinet showing the drum memory unit for control of automated generating units 3 and 4 of Huntington Beach station.

ANUFACTURERS / PRODUCTS

Carolina Power & Light Company hopes to win long bout with marine borers by sheathing poles in marine locations with non-corrosive metal.

In Transformer Rebuilding . . .

Specify Wagner Form W Replacement Assemblies for full NEMA Standard Cores and Coils with new low impedance and lower core losses.

Rebuild your own transformers? Send your rebuilds out? Regardless...it pays to specify Wagner Form W Replacement Core and Coil Assemblies. Do it, and get full NEMA Standard elements, exactly like those used in new Wagner Transformers.

You get the advantages of lower impedance values, better regulation and lower losses. You get the most out of up-rating,

It's the CORE & COILS *that count*

too. In sizes through 15 kva, you can install the largest cores and coils that will fit your tank, and still remain within NEMA temperature rise standards.

Wagner Replacement Assemblies, in ratings from 5 through 167 kva, come to you ready to install. They have been fully tested, vacuum-treated and dried, and are packaged in transformer oil for complete protection. Universal mounting brackets are included with each unit, 25 kva and smaller.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

Wagner Electric Corporation

6424 PLYMOUTH AVE., ST. LOUIS 33, MO.

WR60-6

SERVING 2 GREAT GROWTH INDUSTRIES — ELECTRICAL • AUTOMOTIVE

LIGHT and POWER lines

Adequate Street And Highway Lighting Is Not An travagance—This enlightened viewpoint was ex-ssed recently by Mrs. Omar Ranney, special repre-tative of the Highway Safety Lighting Bureau. She s addressing 2000 delegates and visitors attending 69th annual meeting of the General Federation of omen's Clubs.

While conceding that the cost of street lighting is y one problem faced by city officials who must also rry about such things as sewers, street paving, and reation facilities, Mrs. Ranney made this important nt: "If the streets of the entire United States were ssed with modern, adequate lighting and the cost -rated among the population, it would amount to price of a modest restaurant meal per year, per lividual."

Appealing for the interest and support of the Gen-l Federation of Women's Clubs in solving the prob-n of inadequate street and highway lighting, Mrs. nney said "Your action can be a death-blow to the topus-like hold of street crime and accidents on the ited States. We believe you will feel as we do that s is the highest kind of public service the Federation render."

As most of the nation is well aware, a dramatic ample of what can be accomplished occurred in eveland several years ago. Action by this city's Fed-ation of Women's Clubs was triggered by the sex rder of an 8-year-old girl on a darkened residential eet on New Year's night. The program started by Cleveland Club, which resulted in adequate street d highway lighting for their city, offers a pattern ner groups can follow.

Opportunely, *Reader's Digest* will award a $500 t prize and five $100 runner-up prizes to those local bs of the General Federation of Women's Clubs which initiate the best community programs to improve street and highway lighting during the 12-month period following June 1960. Prizes will be presented at the Federation's 70th annual meeting.

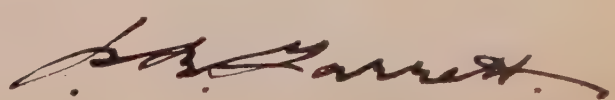
Clearly this is an opportunity for the women of our nation to bring their "not to be underestimated" influence to bear on one of our most acute problems—that of eliminating the shadows and darkness that now shield the perpetrators of rape, murder, and robbery.

Customer Demand Is The Only Lasting Source Of Employment Security—Union and management negotiators at many bargaining tables are again seeking alleviation of one of the most difficult problems of our free society. It is the problem of how to eliminate unemployment and insecurity in an economy which preserves individual freedom to choose between competing offerings—in an economy in which the free customer by his often-unpredictable actions can make or break companies, and create or destroy jobs.

This enigma constitutes an enormous headache for the General Electric Company in its collective bargaining with more than 100 unions. Since this problem plagues every segment of our industry to some degree, it seems pertinent to observe some of G-E's views on the complexities of employment insecurity. These views have resulted from a great deal of intensive research in the field of union and management relations.

The important point is made that the relatively high levels of consumer spendable income has made an ever-greater share of total consumer spending discretionary or optional. While consumers have had steadily more money to spend, they have also had a wider choice of goods and services to spend it on, plus the option of not spending it at all.

Also emphasized is the fundamental consideration that neither G-E nor any other company has the unilateral power to make jobs secure. As long as customers are free to withhold or shift their business, the only way to attain lasting employment security is to please the customer.



Publisher and Editor

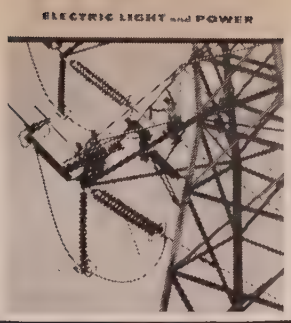
HAYWOOD PUBLISHING COMPANY
PUBLISHERS OF:
- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP and ELECTRIC LIGHT

Vol. 38 Contents for October 15, 1960 No. 20

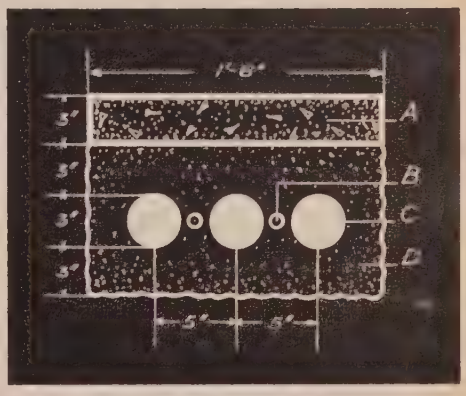
ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—$10.00 per year; other domestic subscribers—75c per single copy or $15.00 per year; Canadian and foreign subscribers—$1.50 per single copy or $20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

d POWER



OUR COVER

Hot-line maintenance at 345 kv is commonplace with AEP, but every precaution is taken to assure safety; here, linemen replace broken insulator with conductors still energized.

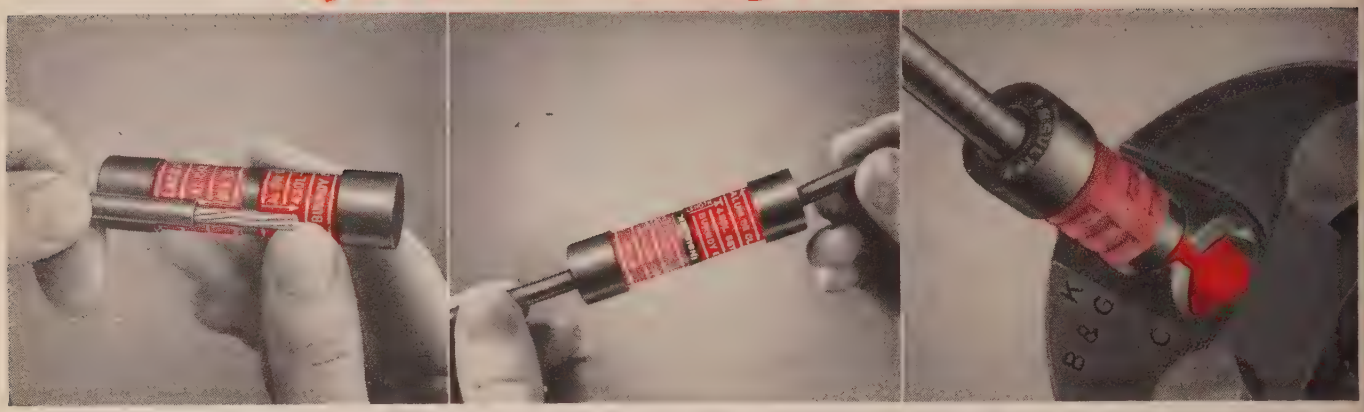


Water cooling greatly increases load capability of directly-buried transmission cable.

Lessons learned from previous storm damage lead to revamping system for improved continuity, faster recovery.

MANUFACTURERS / PRODUCTS

Quick...Easy...Sure



STRIP back cable insulation...arrows on INSULINK show how far.

INSERT wire ends; **caps grip and hold cable,** both hands are free for crimping.

CRIMP with standard compression tool... guide lines on INSULINK show where.

Pre-insulated

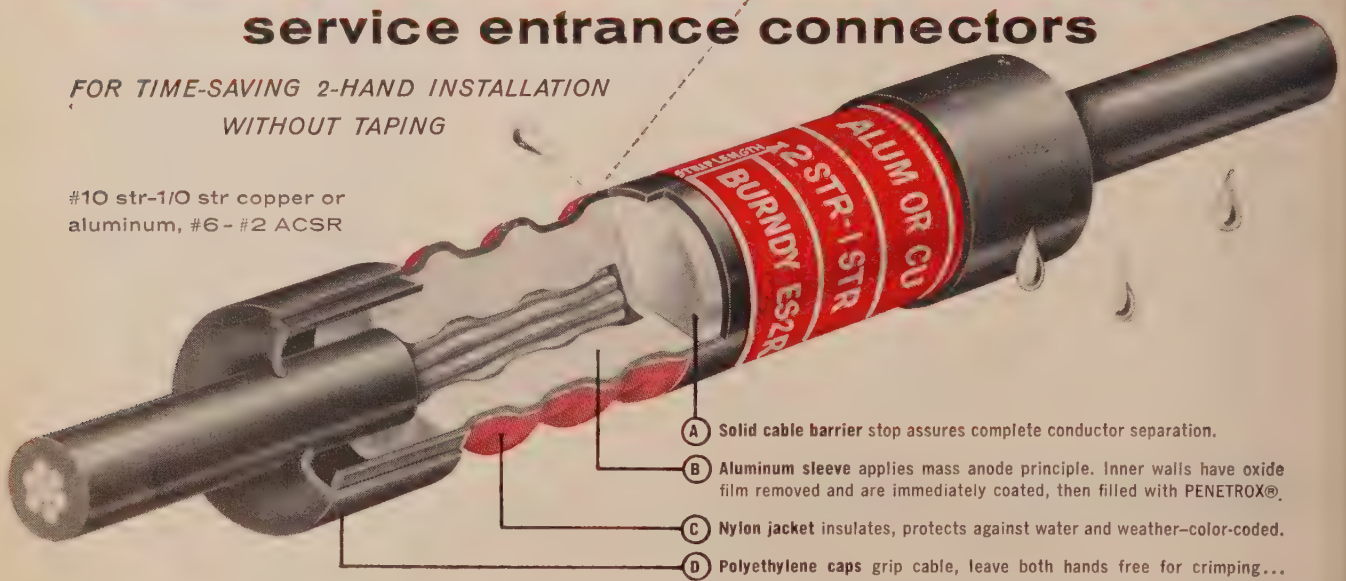
INSULINK®

Patented Other Patents Pending

service entrance connectors

FOR TIME-SAVING 2-HAND INSTALLATION WITHOUT TAPING

#10 str–1/0 str copper or aluminum, #6 - #2 ACSR



(A) **Solid cable barrier** stop assures complete conductor separation.

(B) **Aluminum sleeve** applies mass anode principle. Inner walls have oxide film removed and are immediately coated, then filled with PENETROX®.

(C) **Nylon jacket** insulates, protects against water and weather–color-coded.

(D) **Polyethylene caps** grip cable, leave both hands free for crimping... protect splice against moisture.

Connect service entrances with much less effort, in less time, **without taping.** INSULINK pre-insulated compression connectors are installed in three simple steps with the same crimping tools and dies used to install uninsulated connectors...for time-saving economy...for neat, fully protected, electrically stable connections. INSULINK connections are

QUICK: because there's no taping.

EASY: color-coded connector jacket clearly marked to show cable ranges, strip length, where to crimp. Just strip...insert...crimp; caps hold cable ends in place for simple two-hand installation.

SAFE: fully insulated to protect personnel; protected against water and weather; neat, attractive appearance.

Get the full story on **INSULINK** pre-insulated connectors from

BURNDY

59-6

Norwalk, Connect. In Europe: Antwerp, Belgium Toronto, Canada

LIGHT and POWER lines

Youngsters Given Opportunity To Tour Power Stations At Most Impressionable Age—Plant tours conducted by electric-utility organizations may be "old hat" to many people but not to youngsters about ready to enter high school. To them it is an exciting experience and one that makes a lasting impression. Thus when they become customers of the utility a few years later it is a good bet they will have at least some understanding of how electricity is generated, plus a better appreciation of the services the utility provides. Moreover, many of these youngsters can supply their parents with information which helps create better understanding of the utility.

These were the potential benefits which encouraged the Illinois Power Company to inaugurate such a program last Fall. Results for the first year are now in. They have proved so valuable that the Company has placed the program on a continuing annual basis.

Grade schools in the Company's service area are contacted each year and invited to send either their seventh-grade or eighth-grade class to visit one of the company's four major generating stations. They are also allowed to plan additional trips in conjunction with appropriate study topics. This is an advantage, for example, to teachers of science and electricity.

During the 1959-60 school year, 6118 students from 25 schools toured the Company's four plants. They were accompanied by 253 teachers and, in some cases, parents of the youngsters.

In addition, plant personnel were hosts to other student and adult groups, boosting the total number of visitors above 6500.

To date, 94 schools have scheduled to send 5784 students on the tours this Fall and next Spring.

The average group making the tour this past school year consisted of 48.6 students and two teachers. Cost for box lunches—the major direct expenditure in the program—was about $5906, or close to 80¢ per individual.

Illinois Power is deriving benefits from the program outside the realm of public relations. A number of their service-area people who serve as guides get a chance to make annual visits to the Company's plants and renew acquaintances with power production. These employees not only know more about plant operation now, they also have a better appreciation of the problems and accomplishments of teachers in their communities.

All-in-all, it is a big dividend on a modest investment.

Re-survey Indicates Pickup In Utility Construction In Last Quarter Of 1960—Many of our industry suppliers have had good reason to feel for some time that this year's utility construction program is falling far short of budgeted expenditures for the industry as a whole.

Findings from a recent EL&P re-survey did disclose a slackened pace during about the first seven months of the year. However, accelerated expenditures were also evidenced for the balance of the year, resulting in over-all expenditures very close to budgeted totals.

A very sizeable segment of the industry was included in this sampling of construction activities. Included were 102 utilities with composite construction budgets totalling over $2.8-billion. Budget revisions for this group showed an over-all decrease of only 2.9 percent for this year.

Most importantly for the suppliers, this checkup showed that expenditures for new construction by this representative group of utilities during the last five months of this year should just about equal their expenditures during the first seven months.

This is just a foretaste of what the next few years will bring if our industry is to really get started on the tremendous expansion EEI's recent studies indicated must come if it is to be ready for the demands of 1960-1980.

Publisher and Editor

HAYWOOD PUBLISHING COMPANY
PUBLISHERS OF:
- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP and ELECTRIC LIGHT

Vol. 38 Contents for November 15, 1960 No. 22

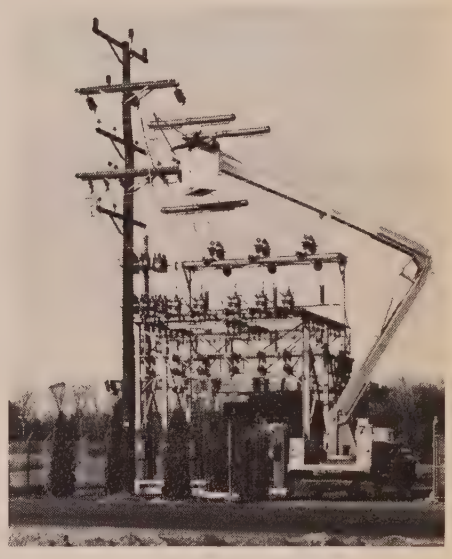
ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—$10.00 per year; other domestic subscribers—75c per single copy or $15.00 per year; Canadian and foreign subscribers—$1.50 per single copy or $20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

ELECTRIC LIGHT and POWER

OUR COVER

Truck mounted cranes equipped with slings do effective job of moving high voltage pipe-type cable on Potomac Electric Power system as highway project makes relocation necessary.

POWER



Program of replacing bolted connectors with compression connectors contributes materially to reduction in line outages on VEPCo's distribution system.

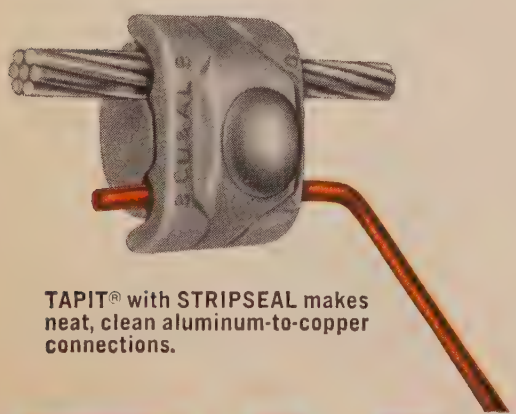
ANUFACTURERS / PRODUCTS

Improved efficiency in handling customer service and index records as a result of mechanization at Georgia Power Company is expected to pay for new system in three years or less.

STRIPSEAL

seals in oxide-inhibiting PENETROX®
...on the connector contact surfaces

No Cutting...No Snipping or Ripping...Just a Gentle Pull



TAPIT® with STRIPSEAL makes neat, clean aluminum-to-copper connections.

and your Burndy STRIPSEALED connector is ready to make a trouble-free aluminum connection. STRIPSEAL, the leak-proof, all-weather, plastic cover hugs the connector like a "cocoon"...seals in oxide-inhibiting PENETROX—on the contact surfaces, where it belongs. **It's easy to use**...even with work gloves on. **It's clean**...just dry brush conductor and install the connector; no on-the-job application of oxide inhibitor needed. **It's sure**...lineman can't forget PENETROX. For positive protection of every connection, specify Burndy connectors with STRIPSEAL. Write for full details.

BURNDY

59-18

Norwalk, Connect. In Europe: Antwerp, Belgium Toronto, Canada

LIGHT and POWER lines

apture Their Interest And See What High School s Can Build!—Is it possible that high school stu-ts would or could design and build an 8000-word d-state digital computer on their own time without eiving any school credit for it? It has been done! t all started when D. M. Boyd, Jr., an engineer ociated with the Universal Oil Products Company, ted the high school in his home town of Hinsdale, nois, to see what was being done in the way of ence education. His visit was prompted by a talk en by Dean John R. Dunning of the Columbia iversity School of Engineering comparing Soviet l American high school scientific education.

Finding that Hinsdale High had a strong science gram, Mr. Boyd volunteered to donate some equip-nt for a ham radio club. When several lads came his home to pick up the equipment, they somehow started on a discussion of digital computers. Ex-iting considerable interest in Mr. Boyd's explana-n of some of the principles of operation of such evice, they started working out a few of the basic cuits. A short time later, using relays given them Mr. Boyd, they were able to try out their circuits. From this simple beginning there developed a ject that snowballed into an 8000-word transistor-d digital computer with the possibility of 128 com-nds. Truly a remarkable machine in any league almost unbelievable to have been designed and lt by high school students. All of this took place Mr. Boyd's basement on the students' own time, h no thought of school credit.

Shortly after the boys built their relay adder, nellit Incorporated donated some surplus relays and ct Panalarm units. These were then incorporated subtracting units, shift registers and memory s. At the end of a year and a half, the boys had lay computer taking shape with a 15-word capacity a word length of ten bits.

Then Bryant Computer Products became interested and donated a magnetic drum which completely revolutionized the project. A short time later Hoffman Semiconductor Division donated 2000 silicon diodes, Panellit donated a Flexowriter and Daystrom Systems donated 200 transistors. Still later, Raytheon donated 500 transistors and 1000 more diodes. International Resistance Company donated 10,000 resistors and Gulton Industries donated 1500 ceramic condensors. A final contribution of 2500 additional silicone diodes and 600 more transistors by the Texas Instruments Company insured completion of the project.

Westinghouse contributed power rectifiers for the project, the Heath Company donated an oscilloscope kit and power supply kit, and miscellaneous other items were contributed by a number of other firms.

During the summer of 1959 the boys worked in Mr. Boyd's basement almost every day for six weeks, sometimes staying until 11 or 12 o'clock at night. Further rapid progress was achieved during the Christmas holidays.

Now Bell & Howell's CEC Division has contributed a 14-channel magnetic tape recorder and Victor Adding Machine Company has donated an actual truck load of miscellaneous equipment.

Thus this has become a contributing project and a mecca for scientifically-minded students.

Such wholehearted support of this unique project by so many companies is deserving of high commendation. It also is a dramatic demonstration of the tremendous interest these companies have in encouraging students to make a start at the high school level to equip themselves for scientific careers.

If enough people in our industry will make it their business to stimulate and foster somewhat comparable scientific endeavors for high school students in their own home towns, we should see a material increase in the number of students who elect to pursue a scientific career. This has become an all-important consideration for our entire nation.

Publisher and Editor

HAYWOOD PUBLISHING COMPANY
PUBLISHERS OF:
- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

ELP and ELECTRIC LIGH

Vol. 38 Contents for December 1, 1960 No. 2

ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis executives and department heads of: electric light and power companies; municipal electric organiz tions; rural electric cooperatives; Federal power administrations; engineering and management servi companies serving the electric utility field; consulting engineers; and companies specializing in electr utility construction throughout the United States and her possessions. To all others there is subscription charge: Manufacturers representatives—$10.00 per year; other domestic subscribers—7 per single copy or $15.00 per year; Canadian and foreign subscribers—$1.50 per single copy or $20. per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

POWER

OUR COVER

Booming summer-home developments around Clear Lake, located approximately 100 miles north of San Francisco, keep Pacific Gas & Electric Company crews busy. Here PG&E lineman John Crone replaces a transformer fuse as the lake glimmers in the morning sun.

Pothead with pressure filling kit used by The Detroit Edison Company.

Typical 13-kv urban distribution on joint occupancy poles at Long Island Lighting Company.

here it is! A REAL
ONE-HAND TOOL

installs
INSULINK® and LINKIT®
one crimp per end!

You'll like this ONE-HAND TOOL . . . from start to finish, you can really work it with only ONE HAND. You can close it with less than a 50 lbs. squeeze; it weighs only 2½ lbs. and is only 12" long. You couldn't ask for an easier service tool . . . it's the only *real* ONE-HAND TOOL.

Position the OH25 once . . . and only once . . . on each side of the INSULINK or uninsulated LINKIT. It has a new die that crimps the entire contact area at one time. You don't have to reposition, you can't overlap crimps, and you never make less than the proper number of crimps.

And, it takes only ONE CRIMP PER END . . . a series of easy, ratchet controlled strokes to make a perfect crimp every time. The new dies cause the conductor strands to rub together, removing the oxide film for more stable, low resistance connections.

Insert stripped wire ends into INSULINK; caps grip and hold conductors.

Get up close to your work. Position ONE-HAND TOOL on INSULINK only once per crimp.

A series of easy strokes complete the crimp. Dies produce oxide removing wiping action between conductor strands.

ANOTHER MAJOR DEVELOPMENT IN THE

BURNDY

60-16

COMPRESSION PROGRAM

NORWALK, CONNECT. BICC—BURNDY Ltd. Prescot, Lancs., England In Continental Europe: Antwerp, Belgium TORONTO, CANADA

LIGHT and POWER lines

An Experiment In All-Electric Rural Living—The ting is a $40,000 all-electric tri-level home in a rural ea of Ohio, occupied by a guinea-pig family of four. e objective of the experiment is to accurately record a two-year period the kilowatthour usage by the ter pump and garbage disposer, water heater, ex- ior lighting, range and appliance center, automatic sher and dryer, heat pump and air conditioner, rigerator, freezer, interior lighting and baseboard ctric heating. Nine watthour meters monitor these cuits, recording both energy and demand.

In this unique case the experimenter is the Lorain- edina Rural Electric Co-operative in Wellington, io, which serves about 5200 members. Its research ject is intended to provide its members with a cost ge for varying power usages in the home.

This experimental home also depends on electric wer for its workshop, an intercom system, humidi- , incinerator, and electric septic tank. The latter s both an aerator and an agitator. Operated auto- tically, it never needs cleaning.

At each of the four corners of the house are double urity lights with an independent power supply. The veway is illuminated by four mushroom lights.

The home is of the pre-cut variety. Interior work s supervised by a master carpenter and the Co-op nager, Karl B. Crawford. The woodworking force s a part of the training group of the Co-operative. ch year five or more high school graduates are ployed, three of them at least must have made angements to enter college. The remaining part of group become the apprentices for the Co-op. Thus Co-op recruits labor from the area and all are e young men. Also the program is a part of the -op's member educational program. For the sum- r's work, each boy receives at least $600 for his or, toward his college expenses.

t is interesting that over 3800 visited the home the first 30 days it was shown to the public, and at the annual meeting on August first 1200 members visited the home. Visitors to date total nearly 6000.

On a group basis, 33 groups not included in the above have had personally conducted tours.

Air conditioning for the month of August with all the people going through the home cost less than 15 dollars on the Co-op's 1½¢ rate. Baseboard heating for the month of September was less than ten dollars.

This commendable experimental endeavor should provide valuable operating-cost data for not only the Co-op members immediately concerned but for our entire industry.

A Notable Achievement In Safe Operations—A salute is due all employees of the Design and Construction and the General Plant Divisions of the Los Angeles Department of Water and Power for their safety records for the fiscal year ended June 30, 1960.

In that period their accident frequency reached an all-time low of 0.62 for the Design and Construction Division and 2.32 for the General Plant Division in on-the-job, lost-time industrial accidents.

This was a 98.7 percent reduction for the Design and Construction Division and a 94.2 percent reduction for the General Plant Division from that of 14 years ago.

Using National Safety Council average costs for industrial accidents, Clayton M. Allen, Engineer in Charge of the General Plant Division, and E. L. Kanouse, Engineer of Design and Construction, have calculated that over the past 14 years these employees have saved the Department $4.4-million, thereby making this important sum available for productive use.

Congratulations to these accident-prevention "pros"!

Publisher and Editor

HAYWOOD PUBLISHING COMPANY
PUBLISHERS OF:
- Electric Light and Power
- Boxboard Containers
- Industrial Packaging
- Consumer Packaging

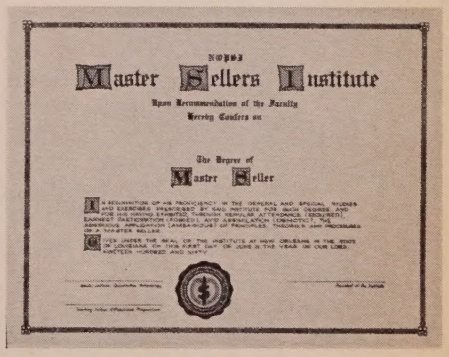
ELP and ELECTRIC LIGH

Vol. 38 Contents for December 15, 1960 No. 24

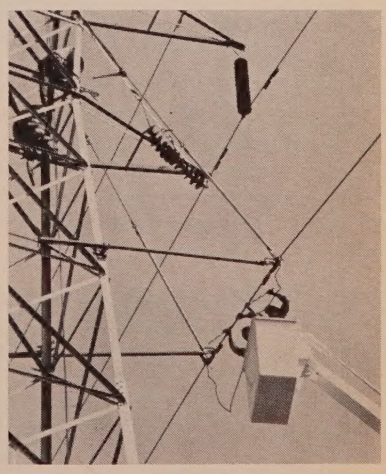
ELECTRIC LIGHT AND POWER is published by the Haywood Publishing Company of Illinois, 6 N. Michigan Avenue, Chicago 2, Illinois. It is published twice monthly and is distributed gratis to executives and department heads of: electric light and power companies; municipal electric organizations; rural electric cooperatives; Federal power administrations; engineering and management service companies serving the electric utility field; consulting engineers; and companies specializing in electric utility construction throughout the United States and her possessions. To all others there is a subscription charge: Manufacturers representatives—$10.00 per year; other domestic subscribers—75c per single copy or $15.00 per year; Canadian and foreign subscribers—$1.50 per single copy or $20.00 per year. Accepted as Controlled Circulation publication at Lafayette, Indiana.

OUR COVER

Extensive testing program begins as construction is completed on PENELEC'S 460-kv line. (See page 56 for the story on this important EHV line.)



2—Master Seller Diplomas are awarded at New Orleans Public Service, Inc.



1—Linemen are installing armor rods on 138-kv hot-line with bare hands.

here it is! A REAL

ONE-HAND TOOL

installs

INSULINK® and LINKIT®

one crimp per end!

You'll like this ONE-HAND TOOL . . . from start to finish, you can really work it with only ONE HAND. You can close it with less than a 50 lbs. squeeze; it weighs only 2½ lbs. and is only 12" long. You couldn't ask for an easier service tool . . . it's the only *real* ONE-HAND TOOL.

Position the OH25 once . . . and only once . . . on each side of the INSULINK or uninsulated LINKIT. It has a new die that crimps the entire contact area at one time. You don't have to reposition, you can't overlap crimps, and you never make less than the proper number of crimps.

And, it takes only ONE CRIMP PER END . . . a series of easy, ratchet controlled strokes to make a perfect crimp every time. The new dies cause the conductor strands to rub together, removing the oxide film for more stable, low resistance connections.

Insert stripped wire ends into INSULINK; caps grip and hold conductors.

Get up close to your work. Position ONE-HAND TOOL on INSULINK only once per crimp.

A series of easy strokes complete the crimp. Dies produce oxide removing wiping action between conductor strands.

ANOTHER MAJOR DEVELOPMENT IN THE

BURNDY

60-16

COMPRESSION PROGRAM

NORWALK, CONNECT. BICC—BURNDY Ltd. Prescot, Lancs., England In Continental Europe: Antwerp, Belgium TORONTO, CANADA